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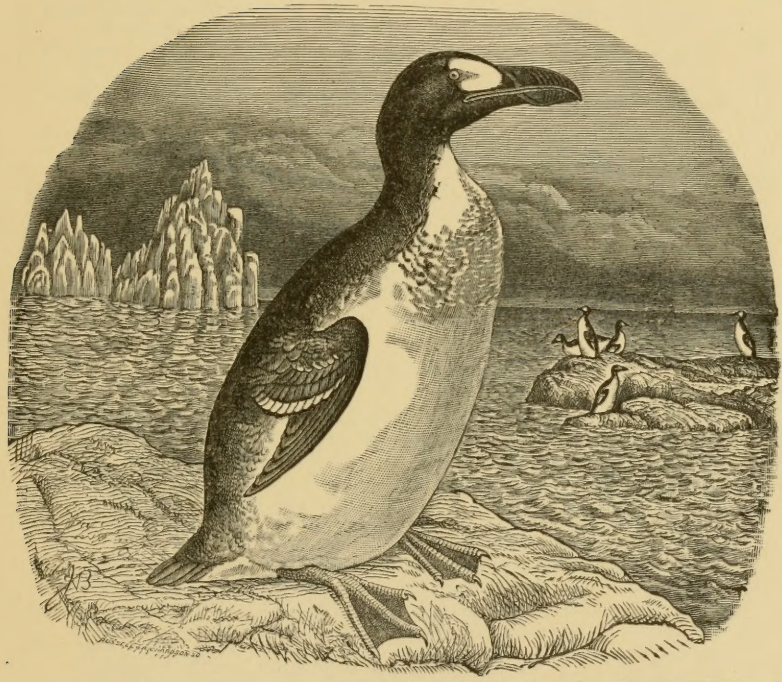
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VOLUME XXIV

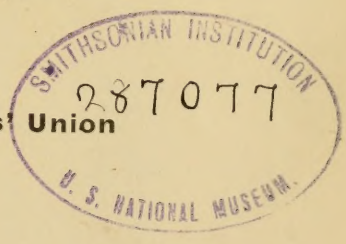
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CONTENTS OF VOL. XXIV.

NUMBER I.

	PAGE
SUMMER BIRD-LIFE OF THE NEWARK, NEW JERSEY, MARSHES. By <i>Clinton G. Abbot. (Plate I.)</i>	1
NOTES ON THE SPRING BIRDS OF TISHOMINGO COUNTY, MISSISSIPPI. By <i>Andrew Allison</i>	12
THE RIO GRANDE SEEDEATER, ITS STATUS AND TECHNICAL HISTORY. By <i>J. A. Allen</i>	26
THE EASTERN FORMS OF <i>GEOTHLYPIS TRICHAS</i> . By <i>Frank M. Chapman</i>	30
NOTES ON THE EARLY LIFE OF LOON CHICKS. By <i>C. William Beebe. (Plate II.)</i>	34
BACHMAN'S WARBLER BREEDING IN LOGAN COUNTY, KENTUCKY. By <i>G. C. Embury</i>	41
THE NEST AND EGGS OF BACHMAN'S WARBLER, <i>Helminthophila bachmani</i> (AUD.), TAKEN NEAR CHARLESTON, SOUTH CARO- LINA. By <i>Arthur T. Wayne</i>	43
UNPUBLISHED LETTERS OF JOHN JAMES AUDUBON AND SPENCER F. BAIRD. By <i>Ruthven Deane</i>	53
BIRDS OF TORONTO, CANADA. II. LAND BIRDS. By <i>James H. Fleming</i>	71
TWENTY-FOURTH CONGRESS OF THE AMERICAN ORNITHOLOGISTS' UNION. By <i>John H. Sage</i>	89

GENERAL NOTES.

Capture of the Glaucous Gull (*Larus glaucus*) in Boston Harbor, Mass., 94; Recent Occurrence of the European Teal and the Marbled Godwit near Portland, Maine, 94; Baird's Sandpiper at Newfound Lake, Hebron, N. H., 94; Another Limpkin (*Aramus giganteus*) in South Carolina, 95; Note on the Clapper Rail in Maine, 95; A Wounded Sora's Long Swim, 96; A Florida Gallinule on the Coast of Massachusetts, 97; The Short-eared Owl and Savanna Sparrow Breeding in Wayne County, Michigan, 97; The Breeding Habits of *Empidonax virens* in Connecticut, 99; *Empidonax griseus* Brewster vs. *Empidonax canescens* Salvin and Godman, 99; The Raven near Portland, Maine, 100; Two Ravens (*Corvus corax principalis*) seen at Harpswell, Maine, 100; The Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) in Georgia, 100; A new Colorado Record for the White-winged Crossbill (*Loxia leucop-tera*), 101; An Early Date for the Arrival of the Ipswich Sparrow (*Passerculus princeps*) on the coast of South Carolina, 101; Macgillivray's Seaside Sparrow (*Ammodramus martinus macgillivrayi*) with Fourteen Rectrices, 102; The Junco Breeding at Wellfleet, Mass., 102; A New White-throat Song, 102; Scarlet Tanager (*Piranga erythromelas*) at Ottawa, Canada, 103; The Nesting of *Stelgidopteryx serripennis* in Norwich, Vt., 103; A New Hampshire Record for *Stelgidopteryx serripennis*, 104; The Philadelphia Vireo (*Vireo philadelphicus*) in Georgia, 104; Connecticut Warbler in Maine, 105; *Cinclus mexicanus* not a Costa Rican Bird, 105; A Carolina Wren in Middlesex Fells, Massachusetts, 105; Some

Corrected Records, 106; Rare Northern Birds near Chicago, Ill., 107; Telescope Observations of Migrating Birds, 107; A Migration Disaster in Western Ontario, 108; Early Appearance of Certain Northern Species at Ottawa, Canada, 110; Audubon's Ornithological Biography, 111.

RECENT LITERATURE.

Beebe's 'The Bird,' 112; Hellmayr on Spix's Types of Brazilian Birds, 113; Thayer and Bangs on Sonoran Birds, 114; Lönnberg on the Birds of South Georgia, 115; Harvie-Brown's 'A Fauna of the Tay Basin,' 115.

CORRESPONDENCE.

The Concilium Bibliographicum as a Bureau of Ornithological Information, 117.

NOTES AND NEWS.

Obituary: William Thomas Blandford, 118; Walter Lawry Buller, 119; The Revision of the Code of Nomenclature, etc. 119; Second Annual Meeting of National Association of Audubon Societies, 120; Important Change of Address, 120.

NUMBER II.

ORNITHOLOGICAL CONDITIONS IN NORTHEASTERN ILLINOIS, WITH NOTES ON SOME WINTER BIRDS. By <i>John F. Ferry</i>	121
THE PRESENT STATUS OF THE ENGLISH SPARROW PROBLEM IN AMERICA. By <i>A. H. Estabrook</i>	129
RECENT ORNITHOLOGICAL DEVELOPMENTS IN SOUTHEASTERN MICHIGAN. By <i>B. H. Swales and P. A. Taverner</i>	135
THE BEWICK WREN IN THE DISTRICT OF COLUMBIA, WITH A DESCRIPTION OF ITS SONG. By <i>Arthur H. Howell and Henry Oldys</i>	149
CONCERNING CERTAIN SUPPOSED INSTANCES OF THE OCCURRENCE OF THE CINNAMON TEAL IN FLORIDA AND SOUTH CAROLINA. By <i>William Brewster</i>	154
ADDITIONAL NOTES ON THE BIRDS OF LEON COUNTY, FLORIDA. By <i>R. W. Williams, Jr.</i>	158
THE MARBLED GODWIT ON ITS BREEDING GROUNDS. By <i>A. C. Bent</i> . (Plate III.)	160
A HYBRID GROUSE, RICHARDSON'S + SHARPTAIL. By <i>Allan Brooks</i> . (Plate IV.)	167
ASPECTS OF BIRD DISTRIBUTION IN LOUISIANA AND MISSISSIPPI. By <i>Henry H. Kopman</i>	169
UNUSUAL ABUNDANCE OF THE AMERICAN GOSHAWK (<i>Accipiter atricapillus</i>). By <i>Ruthven Deane</i>	182
NOTES CONCERNING CERTAIN BIRDS OF LONG ISLAND, N. Y. By <i>William C. Braislín, M. D.</i>	186
SOME CHANGES IN THE CURRENT GENERIC NAMES OF NORTH AMERICAN BIRDS. By <i>Wilmer Stone</i>	189
A CARD SYSTEM OF NOTE-KEEPING. By <i>A. H. Felger</i>	200
NOTES ON THE BLACK RAIL OF CALIFORNIA. By <i>William Brewster</i>	205

GENERAL NOTES.

The Black Tern at Philadelphia, Pa., 211; Ross's Snow Goose in Colorado, 211; The Whistling Swan at Martha's Vineyard, Mass., 212; Whistling Swan (*Olor columbianus*) in Massachusetts, 212; *Ardea egretta* in New Mexico, 212; Late Occurrence of the King Rail (*Rallus elegans*) in Wisconsin, 212; The Stilt Sandpiper — a Correction, 213; The American Rough-legged Hawk Breeding in North Dakota, 213; The Pigeon Hawk in Wayne Co., Michigan, 214; The Goshawk in Montgomery Co., Virginia, 214; The Barn Owl in Massachusetts, 214; Great Gray Owl (*Scotiopteryx nebulosa*), 215; Great Gray Owl (*Scotiopteryx nebulosa*) in Rhode Island, 215; Aggressive Screech Owls, 215; The Snowy Owl (*Nyctea nyctea*) not generally Abundant in the Winter of 1906-1907, 217; Identity of *Tyrannula mexicana* Kaup, 219; White-winged Crossbill at Raleigh, N. C., 220; *Loxia curvirostra minor* in Florida, 220; The Vesper Sparrow on Long Island in Winter, 220; Malformed Bill of Rose-breasted Grosbeak, 220; Breeding of the Rough-winged Swallow in Berkshire County, Mass., 221; Another Connecticut Warbler from Maine, 222; The Blue-gray Gnatcatcher in Massachusetts, 222; Two Interesting Nebraska Records, 223; Autumn Records of the Golden Plover and Lapland Longspur in Wayne Co., Mich., 223; Notes from Western New York, 224; Notes on the Ornithological Works of John James Audubon, 226.

RECENT LITERATURE.

Chapman's 'The Warblers of North America,' 227; Alphéraky's 'The Geese of Europe and Asia,' 229; Oberholser on Birds from East Africa, 230; Schiebel on the Phylogeny of the Species of *Lanius*, 230; Hellmayr on the Types of Little-known Neotropical Birds, 231; Hellmayr on the Birds of Pará, Brazil, 231; Wood's Twenty-five Years of Bird Migration at Ann Arbor, Michigan, 231; Montgomery's 'The Protection of Our Native Birds,' 232; Oberholser's 'The North American Eagles and their Economic Relations,' 232; Cooke's 'The Distribution and Migration of North American Ducks, Geese, and Swans,' 232; Ward's 'Notes on the Herring Gull and Caspian Tern,' 233; Game Laws for 1906, 234; Forbush's 'Useful Birds and their Protection,' 234; Dionne's Birds of the Province of Quebec, 236; Clark's Birds of Amherst, Massachusetts, 236; Cole on Birds from Yucatan, 237; Proceedings of the Delaware Valley Ornithological Club, 237.

NOTES AND NEWS.

Obituary: August Koch, 238. 'The Warbler,' 239; 'American Ornithology,' 239; Australian Ornithologists' Union, 240; Ornithological Section of the Seventh International Congress, 240.

NUMBER III.

THE BIRDS OF CUSTER AND DAWSON COUNTIES, MONTANA. By E. S. Cameron. (Plates V-XII.)	241
THE CROSSBILLS OF NORTHEASTERN WYOMING. By Rev. P. B. Peabody	271

CHARACTERISTIC KAMCHATKAN BIRDS. By <i>Austin H. Clark</i> . . .	278
WINTER BIRD NOTES FROM EXTREME SOUTHERN ILLINOIS. By <i>John F. Ferry</i> . . .	281
ON A COLLECTION OF BIRDS FROM WESTERN COSTA RICA. By <i>Outram Bangs</i> . . .	287
ANOTHER HYBRID HUMMINGBIRD — <i>SELASPHORUS RUFUS</i> + <i>ATTHIS</i> <i>CALLIOPE</i> — FROM CALIFORNIA. By <i>John E. Thayer</i> and <i>Outram Bangs</i> . . .	312
LIST OF THE BIRDS OF LOUISIANA. PART III. By <i>Geo. E. Beyer</i> , <i>Andrew Allison</i> , and <i>Henry H. Kopman</i> . . .	314
AUTUMN WARBLER MIGRATION By <i>J. Claire Wood</i> . . .	322
A NEW <i>AGELAIUS</i> FROM CANADA. By <i>Harry C. Oberholser</i> . . .	332

GENERAL NOTES.

The Kittiwake (*Rissa tridactyla*) on the Coast of Maine in Summer, 337; The Brown Pelican in Indiana, 337; The Whistling Swan in Northeastern Illinois, 337; The Glossy Ibis in Central New York, 338; Another Specimen of Cory's Bittern, 338; The Little Blue Heron in Philadelphia County, Pa., in Spring, 338; A Woodcock Nesting in St. Louis, Missouri, 339; The Stilt Sandpiper in Massachusetts, 339; The White-rumped Sandpiper in Michigan, 339; Probable Breeding of the Wandering Tattler in the Interior of Alaska, 340; A Correction: Concerning the Occurrence of *Numenius borealis* on Long Island, 341; The English Sparrow in Texas, 341; Lincoln's Sparrow (*Melospiza lincolni*) at Portland, Maine, 341; The Prothonotary Warbler in Colorado, 342; '*Helminthophila lawrencei*' near the District of Columbia, 342; Capture of Lawrence's Warbler near Boston, 343; The Breeding of Brewster's Warbler near Boston, 343; Ten Birds New to the Avifauna of Kansas, 344; A Kentucky Warbler near Boston, Mass., 344; Many Eyes are Better than One Pair, 346; Some Interesting Records from Southern Missouri, 348; Audubon's Ornithological Biography, 349.

RECENT LITERATURE.

Salvin and Godman's 'Biologia Centrali-Americana.—Aves,' 350; Proceedings of the Fourth International Ornithological Congress, 352; Newton's 'Ootheca Wolleyana,' 354; Mershon's 'The Passenger Pigeon,' 355; Fleming on the Disappearance of the Passenger Pigeon, 257; Report on the Immigration of Birds in England and Wales in the Spring of 1906, 357; Forbes's 'An Ornithological Cross-section of Illinois in Autumn,' 358; Bangs on the Wood Rails, 359; Berlepsch on New Neotropical Birds, 359; Berlepsch on the Tyrannidae, 360; Berlepsch on the Genus *Elaenia*, 360; Berlepsch and Stolzmann on Birds from Peru, 361; Jourdain's 'The Eggs of European Birds,' 361; Hartert's 'Die Vögel der Paläarktischen Fauna,' Heft IV, 362; Beebe on the 'Owls of the Nearctic Region,' 362; Woodruff's 'The Birds of the Chicago Area,' 363; Fleming on Migrations of Brünnich's Murre, 364; Lass's 'Bird Life of a City Garden,' 364; Shufeldt on the Osteology of the Tubinares, 336.

NOTES AND NEWS.

Obituary: Alfred Newton, 365; Thomas Henry Douglass, 366. A. O. U. Committee on Nomenclature, 367; New York Zoological Park, 367; Bird Groups in the American Museum of Natural History, 368; E. T. Seton's Expedition to Arctic America, 368.

NUMBER IV.

	PAGE
A LAPLAND LONGSPUR TRAGEDY. By <i>Thomas S. Roberts, M. D.</i> (<i>Plates XIII and XIV.</i>)	369
OBSERVATIONS ON SOME BIRDS PROCURED NEAR CHARLESTON, S. C. By <i>Arthur T. Wayne</i>	377
ON HYBRIDS BETWEEN THE MALLARD (<i>Anas boschas</i>) AND CERTAIN OTHER DUCKS. By <i>Henry B. Bigelow</i>	382
THE BIRDS OF CUSTER AND DAWSON COUNTIES, MONTANA. By <i>E.</i> <i>S. Cameron.</i> (<i>Plates XV and XVI.</i>)	389
SUMMER BIRDS OF SOUTHWESTERN SASKATCHEWAN. By <i>A. C.</i> <i>Bent.</i> (<i>Plates XVII-XX.</i>)	407
FURTHER NOTES FROM EXTREME SOUTHERN ILLINOIS. By <i>John F.</i> <i>Ferry</i>	430

GENERAL NOTES.

The Kittiwake and Purple Sandpiper again in Maine in Summer, 435; That Cinnamon Teal Record from Florida, 435; The Snowy Heron in Camden County, N. J., 436; American Coot (*Fulica americana*) nesting near Newark, N. J., 436; The Stilt Sandpiper in Massachusetts, 437; The Buff-breasted Sandpiper (*Tryngites subruficollis*) on Long Island, N. Y., 437; American Goshawk (*Accipiter atricapillus*) versus Man and Barred Owl, 437; Unusual Occurrence of the Short-eared Owl in Pennsylvania, 438; The Breeding of the Short-eared Owl (*Asio accipitrinus*) near Ann Arbor, Michigan, 439; Mortality among Kingfishers, 439; The American Crossbill in Camden County, Ga., 439; Nesting of Crossbills in Colorado, 440; Occurrence of a White-winged Crossbill at Oxen Hill, Md., in August, 442; The Vesper Sparrow (*Poæcetes gramineus*) on Long Island, N. Y., 442; A White-throated Sparrow in Washington, D. C., in August, 442; Nesting of the Rose-breasted Grosbeak in Philadelphia County, Pa., 442; An Intergrade between *Helminthophila pinus* and *H. leucobronchialis* captured in Hyde Park, Mass., 443; Additional Notes on the Brewster's Warbler in the Arnold Arboretum, Jamaica Plain, Mass., 444; *Helminthophila leucobronchialis* (Brewst.) in Lexington, Mass., 444; A Correction, 446; The Northern Water-Thrush again Nesting in Massachusetts, 446; A Mockingbird (*Mimus polyglottos*) in Lexington, Mass., in Winter and Summer, 446; The Great Carolina Wren in Southern Rhode Island, 446; Large Set of Brown-headed Nuthatch's Eggs, 447; A Recent Blue-gray Gnatcatcher (*Poliophtila cærulea*) in Delaware Co., Pa., 447; Two Birds New for Ohio (*Oceanites oceanicus*) and (*Merula migratoria achrustera*), 447; Pettiver's 'Gazophylacium,' 448; Supplemental Note to 'A Lapland Longspur Tragedy,' 449.

RECENT LITERATURE.

Ridgway's 'The Birds of North and Middle America,' Part IV, 450; Townsend and Allen's 'Birds of Labrador,' 451; Townsend's 'Along the Labrador Coast,' 453; Clark on New Birds from Eastern Asia and the Aleutian Islands, 453; Blackwelder's Notes on Chinese Zoölogy, 453; Bangs on Birds from Costa Rica and Chiriqui, 453; Clarke 'On the Birds of the Weddell and adjacent Seas, 454; Goelde's 'Album de Aves Amazonicas,' 455; Mrs.

Davenport's 'Birds of Windham and Bennington Counties, Vermont,' 456; Herman's *The Protection of Birds in Hungary*, 456; Williams's 'Game Commissions and Wardens, 457; Anderson's 'The Birds of Iowa,' 458; Rich's 'Feathered Game of the Northeast,' 459.

CORRESPONDENCE.

Protective Coloration, 460.

NOTES AND NEWS.

Obituary, Dr. William LaGrange Ralph, 461. The Seventh International Zoological Congress, 462; Twenty-fifth Congress of the American Ornithologists' Union, 466.

ILLUSTRATIONS.

PLATES.

- Plate I. Nest and Eggs of Pied-billed Grebe; Nest and Eggs of Florida Gallinule.
- " II. Loon chicks, 24 and 48 hours old.
 - " III. Marbled Godwit: nesting grounds; on its nest; nest and eggs.
 - " IV. Hybrid Grouse — Richardson's + Sharp-tailed.
 - " V. Nesting-site of Duck Hawk on Yellowstone River.
 - " VI. Badlands on Yellowstone River.
 - " VII. Pine hills and badlands on Yellowstone River.
 - " VIII. Young Great-Blue Heron; nest of Long-billed Curlew.
 - " IX. Sharp-tailed Grouse; nest of Mourning Dove.
 - " X. Goshawk with a Sharp-tailed Grouse (two views).
 - " XI. Sparrow Hawk (two views).
 - " XII. Nest of Ferruginous Rough-leg; young Western Great-Horned Owls.
 - " XIII. A Lapland Longspur Tragedy.
 - " XIV. Lapland Longspurs killed during a storm at Worthington, Minn. (two views).
 - " XV. Young Magpies; Piñon Jay's haunts.
 - " XVI. Piñon Jay fledgling; nesting site of Say's Phoebe.
 - " XVII. The plains north of Maple Creek, Saskatchewan; Cypress Hills, Saskatchewan.
 - " XVIII. Nests and nesting site of Western Grebe (two views).
 - " XIX. Nest of Canada Goose; young Long-billed Curlew.
 - " XX. Nest of Ferruginous Rough-leg; Prairie Sharp-tailed Grouse on nest.

TEXT-CUTS.

Malformed bill of Rose-breasted Grosbeak	.	.	.	page 221
Sketch-map of Dawson County, Montana	.	.	.	" 244
Sketch-map of Custer County, Montana	.	.	.	" 244

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EVANS, ARTHUR H., 9 Harvey Road, Cambridge, England.....	1899
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FERRARI-PEREZ, PROF. FERNANDO, Naturalist Mexican Geol. Expl. Commission, Pueblo, Mexico.....	1885
FREKE, PERCY EVANS, 7 Limes Road, Folkstone, Kent, England....	1883
FÜRBRINGER, PROF. MAX, Director Anatom. Institute, University of Heidelberg, Heidelberg, Germany.....	1891
GADOW, DR. HANS, Zoölogical Museum, Cambridge, England.....	1884
GIRTANNER, DR. A., St. Galle, Switzerland.....	1884
GODMAN, F. DU CANE, 10 Chandos Street, Cavendish Sq., London...	1883
GODWIN-AUSTEN, Lieut.-Col. H. H., Nore, Hascombe, Godalming, England.....	1884
GOELDI, DR. EMIL A., 36 Zieglerstrasse, Bern, Switzerland.....	1903
GRANDIDIER, ALFRED, 6 Rond-Point des Champs Elysées, Paris....	1883
GRANT, WILLIAM R. OGILVIE, 29 Elvaston Place, London, S. W.....	1899

GURNEY, JOHN HENRY, Keswick Hall, Norwich, England.....	1883
HARTING, JAMES EDMUND, Edgewood, Weybridge, Surrey, England..	1883
HAYEK, DR. GUSTAV VON, Vienna.....	1884
HELLMAYR, DR. E. C., Zoölogical Museum, Tring, England.....	1903
HENSON, HARRY V., Yokohama.....	1888
HUDSON, WILLIAM HENRY, Tower House, St. Luke's Road, West- bourne Park, London, W.....	1895
IHERING, DR. HERMANN VON, Museu Paulista, Sao Paulo, Brazil....	1902
KNUDSON, VALDEMAR, Kauai, Hawaiian Islands.....	1888
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KRÜPER, DR. THEOBALD J., University Museum, Athens, Greece....	1884
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MACFARLANE, ROBERT, Winnipeg, Manitoba.....	1886
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NAMIYE, M., Tokio.....	1886
NICHOLSON, FRANCIS, The Knoll, Windermere, England.....	1884
NORTH, ALFRED J., Australian Museum, Sydney, New South Wales..	1902
OATES, EUGENE WILLIAM, 1 Carlton Gardens, Ealing, London, W...	1884
PALMÉN, DR. J. A., Helsingfors, Finland.....	1883
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ASSOCIATES.

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ALLISON, WILLIAM B., 1320 St. Charles Ave., New Orleans, La.....	1905
AMES, J. H., 62 Charles St., Toronto, Ontario.....	1895
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ANGELL, WALTER A., 37 N. Main St., Providence, R. I.....	1901
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BOWDISH, Mrs., B. S., Demarest, N. J.	1902
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BOWLES, JOHN HOOPER, 401 S. G. St., Tacoma, Wash.	1891
BOYD, ERNEST, 4276 Cook Ave., St. Louis, Mo.	1906
BRACKEN, Mrs. HENRY MARTYN, 1010 Fourth St., S. E., Minneapolis, Minn.	1897
BRADFORD, Mrs. J. L., Morris Building, New Orleans, La.	1897
BRADFORD, MOSES B. L., Concord Public Library, Concord, Mass.	1889
BRADLEE, THOMAS STEVENSON, Somerset Club, Boston, Mass.	1902
BRANDRETH, COURTENAY, Cliff Cottage, Ossining, N. Y.	1905
BRANDRETH, FRANKLIN, Cliff Cottage, Ossining, N. Y.	1889
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BROCKWAY, ARTHUR WILLIAM, Hadlyme, Conn.	1906
BROOKS, ALLAN, Okanagan Landing, B. C.	1902
BROOKS, Rev. EARLE AMOS, Weston, W. Va.	1892
BROWN, D. E., 949 24th Ave., Seattle, Wash.	1906
BROWN, EDWARD J., Lemon City, Florida.	1891
BROWN, HUBERT H., 100 Gothic Ave., Toronto Junction, Ontario.	1889
BROWN, LEWIS BOYER, City Engineer's Dept., City Hall, Toronto, Ontario.	1904
BROWN, STEWARDSON, 20 E. Penn St., Germantown, Philadelphia, Pa.	1895
BROWNSON, W. H., Superintendent of Schools, Portland, Me.	1903
BRYANT, OWEN, Cohasset, Mass.	1903
BUCHANAN, C. S., New Haven, Mo.	1906
BUCK, HENRY ROBINSON, 18 Girard Ave., Hartford, Conn.	1897
BUMPUS, Dr. HERMON C., Am. Mus. Natural History, New York City.	1901
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BURTCH, VERDI, Branchport, N. Y.	1903
BURTIS, HENRY MOTT, Babylon, N. Y.	1897
BUTLER, Miss CHARLOTTE W., 75 Cabot St., Beverly, Mass.	1904
BUTLER, ERNEST A., 3417 N. 19th St., Philadelphia, Pa.	1906
BUXBAUM, Mrs. CLARA E., St. Joseph, Mich.	1895
CABOT, LOUIS, Brookline, Mass.	1904
CADY, Mrs. JOHN H., 127 Power St., Providence, R. I.	1905
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CAMERON, E. S., Fallon, Montana.	1903
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EDDY, NEWELL A., 615 Grant Place, Bay City, Mich.....	1885
EDSON, JOHN M., 2210 Victor St., Bellingham, Wash.....	1886
EHINGER, Dr. CLYDE E., 15 Normal Ave., West Chester, Pa.....	1904
EICHE, AUGUST, 1133 O St., Lincoln, Neb.....	1902
EIFRIG, Rev. C. W. GUSTAVE, 210 Wilbrod St., Ottawa, Ont.....	1901
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ELROD, Prof. MORTON J., 205 S. 5th St., East, Missoula, Montana.....	1892
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EMBODY, GEORGE CHARLES, 78 Seymour St., Auburn, N. Y.....	1898
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EMMET, W. L. R., 48 Worthington Ave., Schenectady, N. Y.....	1905
EMORY, Mrs. MARY DILLE, 156 Foundry St., Morgantown, W. Va.....	1899
ENDERS, JOHN O., Box 546, Hartford, Conn.....	1904
ERICSON, LAWRENCE E., 155 Rogers Ave., Brooklyn, N. Y.....	1901
ESSICK, WILLIAM S., 536 Penn St., Reading, Pa.....	1906
EUSTIS, RICHARD S., 11 Wadsworth House, Cambridge, Mass.....	1903
EVANS, WILLIAM B., 205 E. Central Ave., Moorestown, N. J.....	1897
EVERETT, WILLIAM M., 200 W. 99th St., New York City.....	1902
FARLEY, JOHN A., 105 Summer St., Malden, Mass.....	1904
FARR, MARCUS S., Princeton University, Princeton, N. J.....	1900
FARWELL, Mrs. FRANCIS COOLEY, Edgewood, Lake Forest, Ill.....	1898
FARWELL, Mrs. JOHN V., Jr., Edgewood, Lake Forest, Ill.....	1896
FAULKS, EMORY N., 22 Madison Ave., Madison, N. J.....	1902
FELGER, ALVA HOWARD, North Side High School, Denver, Colo.....	1898
FELL, Miss EMMA TREGO, Holicong, Pa.....	1903
FERRY, JOHN FARWELL, Field Museum of Nat. Hist., Chicago, Ill.....	1894
FIELD, EDWARD B., 232 Floyd St., Toledo, Ohio.....	1898
FINLEY, WILLIAM L., 264 Madison St., Portland, Ore.....	1904
FISHER, Miss ELIZABETH WILSON, 1502 Pine St., Philadelphia, Pa.....	1896
FISHER, WILLIAM HUBBELL, 13 Wiggins Block, Cincinnati, Ohio.....	1883
FLANAGAN, JOHN H., 392 Benefit St., Providence, R. I.....	1898
FLETCHER, Mrs. MARY E., Proctorsville, Vt.....	1898
FOOTE, Miss F. HUBERTA, 90 Locust Hill Ave., Yonkers, N. Y.....	1897
FORBES, HENRY S., Milton, Mass.....	1904
FORDYCE, GEO. L., 40 Lincoln Ave., Youngstown, Ohio.....	1901
FORSYTH, DOUGLAS, Box 1808, New Orleans, La.....	1906
FOWLER, FREDERICK HALL, 221 Kingsley Ave., Palo Alto, Cal.....	1892
FOWLER, HENRY W., Acad. Nat. Sciences, Philadelphia, Pa.....	1898
FOX, Dr. WILLIAM H., 1826 Jefferson Place, Washington, D. C.....	1883

FRASER, DONALD, Johnstown, N. Y.....	1902
FREEMAN, Miss HARRIET E., 37 Union Park, Boston, Mass.....	1903
FRENCH, CHARLES H., Canton, Mass.....	1904
FULLER, CHARLES ANTHONY, Summit Road, Brookline, Mass.....	1894
FULLER, T. OTIS, Needham, Mass.....	1904
FUTCHER, Dr. THOMAS B., 3 W. Franklin St., Baltimore, Md.....	1906
GALLUP, ASA H., 65 James St., Ottawa, Ontario.....	1905
GAMMELL, IVES, 170 Hope St., Providence, R. I.....	1903
GANO, Miss LAURA, Earham Place, Richmond, Ind.....	1903
GARDINER, CHARLES BARNES, 5 Minard Place, Norwalk, Ohio.....	1903
GARRICK, JAMES P., Jr., Weston, Richmond Co., S. C.....	1906
GATES, GEORGE B., Madison, S. D.....	1904
GATH, JOHN, Box 236 Torrington, Conn.....	1901
GIBSON, LANGDON, 18 Washington Ave., Schenectady, N. Y.....	1904
GIFFORD, EDWARD WINSLOW, 3256 Briggs Ave., Alameda, Cal.....	1904
GLEASON, Rev. HERBERT W., 83 Pinckney St., Boston, Mass.....	1894
GODDARD, F. N., 33 E. 50th St., New York City.....	1901
GOODALE, Dr. JOSEPH LINCOLN, 258 Beacon St., Boston, Mass.....	1885
GOODRICH, JULIET T., 10 Astor St., Chicago, Ill.....	1904
GOODWIN, Miss AMELIA M., 10 Follen St., Cambridge, Mass.....	1904
GOSS, Mrs. ALETTA W., 5475 Ridgewood Court, Chicago, Ill.....	1902
GOULD, JOSEPH E., 5 Clifton St., Norfolk, Va.....	1889
GRANGER, Miss HELEN, Pierce Hall, Cambridge, Mass.....	1904
GRANGER, WALTER W., Am. Mus. Nat. Hist., New York City.....	1891
GRAVES, Mrs. CHARLES B., 66 Franklin St., New London, Conn.....	1905
GREENE, EARLE R., 470 Jackson St., Atlanta, Ga.....	1905
GREENOUGH, Mrs. AMELIA P., 377 Beacon St., Boston, Mass.....	1904
GREENOUGH, HENRY VOSE, 45 Carlton St., Brookline, Mass.....	1901
GREGORY, STEPHEN S., Jr., 89 Astor St., Chicago, Ill.....	1906
GRIFFING, MOSES BOWDITCH, Shelter Island Heights, N. Y.....	1897
HADLEY, ALDEN H., Monrovia, Ind.....	1906
HALES, HENRY, Ridgewood, N. J.....	1890
HALL, H. PORTER, Leominster, Mass.....	1904
HAMFELDT, A., The Ware Times, Ware, Ia.....	1892
HAMILTON, CAMPBELL T., 216 77th St., Brooklyn, N. Y.....	1905
HAMLIN, GEORGE L., R. F. D. 9, Fairfield, Conn.....	1893
HANKINSON, THOMAS LEROY, Charleston, Ill.....	1897
HANN, HERBERT H., 700 Springfield Ave., Summit, N. J.....	1903
HARDON, Mrs. HENRY W., 315 West 71st St., New York City.....	1905
HARDY, JOHN H., Jr., 24 Irving St., Arlington, Mass.....	1905
HARRIMAN, Miss MARY, 1 E. 55th St., New York City.....	1899
HARTLEY, INNESS, 314 W. 86th St., New York City.....	1901
HARVEY, J. DOWNEY, 2555 Webster St., San Francisco, Cal.....	1906
HARVEY, Miss RUTH SAWYER, Bond Hill, Cincinnati, Ohio.....	1902
HASKELL, Miss HELEN P., 1207 Henry St., Alton, Ill.....	1905
HATHAWAY, HARRY S., Box 498, Providence, R. I.....	1897

HAVEMEYER, H. O., Jr., Mahwah, N. J.....	1893
HAZARD, Hon. R. G., Peace Dale, R. I.....	1885
HEAD, Miss ANNA, 2538 Channing Way, Berkeley, Cal.....	1903
HEALEY, Rev. SULLIVAN SCOTT, Pullman, Wash.....	1906
HEERMANCE, EDGAR THORNTON, 364 Palisade Ave., Yonkers, N. Y.....	1903
HELME, ARTHUR H., Miller Place, N. Y.....	1888
HEMPHILL, ASHTON E., Holyoke, Mass.....	1905
HENCHLEY, MICHAEL F., Box 252 Unionville, Conn.....	1906
HENDERSON, Judge JUNIUS, Boulder, Colo.....	1903
HENDRICKSON, W. F., 276 Hillside Ave., Jamaica, N. Y.....	1885
HENNING, CARL FRITZ, 922 8th St., Boone, Ia.....	1906
HENNINGER, Rev. WALTHER F., 206 Jefferson St., Tiffin, Ohio.....	1898
HERRICK, HAROLD, 46 Cedar St., New York City.....	1905
HIGBEE, HARRY G., 13 Austin St., Hyde Park, Mass.....	1900
HILL, A. C., 400 Pleasant St., Belmont, Mass.....	1905
HILL, JAMES HAYNES, Box 485, New London, Conn.....	1897
HILL, Mrs. THOMAS R., 4629 Baltimore Ave., Philadelphia, Pa.....	1903
HINDSHAW, HENRY HAVELOCK, D. & H. R. R. system, Albany, N. Y.....	1897
HINE, Prof. JAMES STEWART, Ohio State Univ., Columbus, Ohio....	1899
HINE, Mrs. JANE L., Sedan, Ind.....	1890
HINTON, Miss SUSAN McV., 41 W. 32d St., New York City.....	1900
HITCHCOCK, FRANK H., 658 Chestnut St., Waban, Mass.....	1891
HIX, GEORGE E., 630 Columbus Ave., New York City.....	1904
HODGE, Prof. CLIFTON FREMONT, Clark Univ., Worcester, Mass.....	1899
HOLBROOK, Miss ISABEL B., Rhode Island Normal School, Providence, R. I.....	1905
HOLDEN, Mrs. EMELINE R., 13 E. 79th St., New York City.....	1902
HOLDEN, Mrs. EDWIN B., 323 Riverside Drive, New York City....	1903
HOLLAND, Dr. WILLIAM J., 5th and Bellefield Aves., Pittsburgh, Pa.....	1899
HOLLISTER, NED, Biological Survey, Dept. of Agriculture, Washington, D. C.....	1894
HOLLISTER, WARREN D., Continental Oil Co., Denver, Colo.....	1901
HOOKE, Mrs. CHARLES PARKER, 67 Chestnut St., Springfield, Mass.....	1903
HORSFALL, BRUCE, 67 Wiggins St., Princeton, N. J.....	1905
HOWARD, J. STANLEY, Box 52, Silver Lake Assembly, N. Y.....	1904
HOWARD, OZORA WILLIAM, Box 1177, Los Angeles, Cal.....	1898
HOWE, CARLTON D., Essex Junction, Vt.....	1901
HOWE, REGINALD HEBER, Jr., Middlesex School, Concord, Mass.....	1895
HOWLAND, RANDOLPH H., 130 Grove St., Montclair, N. J.....	1903
HUÉBARD, Mrs. SARA A., 177 Woodruff Ave., Brooklyn, N. Y.....	1891
HUBEL, FREDERICK C., Clarkston, Mich.....	1903
HUNN, JOHN T. SHARPLESS, 1218 Prospect Ave., Plainfield, N. J....	1895
HUNT, CHRESWELL J., 225 N. 53rd St., West Philadelphia, Pa.....	1902
HUNTER, W. D., Box 208, Dallas, Texas.....	1899
INGALLS, CHARLES E., East Templeton, Mass.....	1885

INGERSOLL, ALBERT M., 818 5th St., San Diego, Cal.....	1885
IRVING, JOHN, 550 Park Av., New York City.....	1894
ISHAM, C. B., 30 E. 63d St., New York City.....	1891
JACKSON, THOMAS H., 343 E. Biddle St., West Chester, Pa.....	1888
JAGER, H. J., 222 State Ave., Owatonna, Minn.....	1904
JANNEY, NATHANIEL E., 112 Drexel Bldg., Philadelphia, Pa.....	1899
JENKINS, HUBERT OLIVER, Stanford University, Cal.....	1902
JENNEY, CHARLES F., 35 Congress St., Boston, Mass.....	1905
JOHNSON, EVERETT EDWIN, R. F. D. 1, Box 46, Hebron, Me.....	1896
JOHNSON, FRANK EDGAR, 16 Amackassin Terrace, Yonkers, N. Y....	1888
JOHNSON, JAMES HOWARD, Bradford, N. H.....	1894
JOHNSON, WALTER ADAMS, 18 Gramercy Park, New York City.....	1898
JOHNSON, WILLIAM S., Boonville, N. Y.....	1893
JONAS, Miss ANNA C., 383 Erskine St., Detroit, Mich.....	1906
JORDAN, A. H. B., Everett, Wash.....	1888
JUDD, ELMER T., Cando, N. D.....	1895
JUDD, H. CORNELIUS, Bethel, Conn.....	1906
JUDD, ROBERT S., Bethel, Conn.....	1906
JUDSON, CLAY, 258 Knapp St., Milwaukee, Wis.....	1906
KEAYS, JAMES EDWARD, 328 St. George St., London, Ontario.....	1899
KEIM, THOMAS DANIEL, 405 Radcliffe St., Bristol, Pa.....	1902
KELKER, WILLIAM A., Box 114, Harrisburg, Pa.....	1896
KELLOGG, Prof. VERNON L., Stanford University, Cal.....	1888
KENDALL, Miss BLANCHE, 20 Dudley St., Brookline, Mass.....	1904
KENNARD, FREDERIC HEDGE, Dudley St., Newton Centre, Mass....	1892
KENT, GEORGE H., Suffolk, Miss.....	1905
KERMODE, FRANCIS, Curator Provincial Museum, Victoria, B. C....	1904
KEYES, Prof. CHAS. R., Mt. Vernon, Ia.....	1904
KIDDER, NATHANIEL T., Milton, Mass.....	1906
KILGORE, WILLIAM, Jr., 2634 Fremont Ave. N., Minneapolis, Minn..	1906
KING, LE ROY, 20 E. 84th St., New York City.....	1901
KIRKHAM, MRS. JAMES W., 275 Maple St., Springfield, Mass.....	1904
KIRKWOOD, FRANK C., Twiggstown, Alleghaney Co., Md.....	1892
KLUGH, A. B., 7 Wellington St., Kingston, Ont.....	1904
KNAEBEL, ERNEST, 1040 Josephine St., Denver, Colo.....	1906
KNAPP, MRS. HENRY A., 301 Quincy Ave., Scranton, Pa.....	1905
KNIGHT, ORA WILLIS, 84 Forest Ave., Bangor, Me.....	1893
KNOLHOFF, FERDINAND WILLIAM, 28 Winans St., East Orange, N. J.	1897
KOPMAN, HENRY HAZLITT, Ellisville, Miss.....	1899
KUTCHIN, Dr. VICTOR, Dartford, Wis.....	1905
LACEY, HOWARD GEORGE, Kerrville, Texas.....	1899
LANTZ, Prof. DAVID ERNEST, Dept. of Agriculture, Washington, D. C.	1885
LARRABEE, AUSTIN P., 232 W. First North St., Salt Lake City, Utah.	1902
LATIMER, Miss CAROLINE P., 19 Pierrepont St., Brooklyn, N. Y....	1898
LAURENT, PHILIP, 31 E. Mt. Airy Ave., Mt. Airy, Philadelphia, Pa...	1902
LECHASSEUR, A., Trois-Pistoles, Quebec.....	1905

LEE, Prof. LESLIE ALEXANDER, 3 Bath St., Brunswick, Me.....	1903
LEVERING, THOMAS HENRY, Grant Road, Washington, D. C.....	1898
LINCOLN, ALBERT L., Walnut Place, Brookline, Mass.....	1904
LINTON, Miss MARY J., 163 East St., Pittsfield, Mass.....	1903
LOOMIS, JOHN A., Mereta, Texas.....	1887
LORD, Rev. WILLIAM R., Rockland, Mass.....	1901
LORING, J. ALDEN, Owego, New York.....	1889
LOWE, WILLOUGHBY P., Okehampton, Devon, England.....	1893
LUM, EDWARD H., Chatham, N. J.....	1904
MACDOUGALL, GEORGE R., 131 W. 73rd St., New York City.....	1890
MACLAY, MARK W., Jr., 13 W. 31st St., New York City.....	1905
MADDOCK, Miss EMELINE, The Belgravia, Philadelphia, Pa.....	1897
MAHER, J. E., Windsor Locks, Conn.....	1902
MAITLAND, ALEXANDER, 45 Broadway, N. Y. City.....	1906
MAITLAND, ROBERT L., 45 Broadway, New York City.....	1889
MARCH, Prof. JOHN LEWIS, Union College, Schenectady, N. Y.....	1903
MARLEY, JOHN S., 4123 Oak St., Kansas City, Mo.....	1906
MARRS, Mrs. KINGSMILL, Saxonville, Mass.....	1903
MARSDEN, H. W., Witch Creek, Cal.....	1904
MARSH, DANIEL J., Five cent Savings Bank, Springfield, Mass.....	1894
MARTIN, Miss MARIA ROSS, Box 365, New Brunswick, N. J.....	1902
MAXON, WILLIAM R., U. S. Nat. Mus., Washington, D. C.....	1906
MCATEE, WALDO LEE, Dept. of Agriculture, Washington, D. C.....	1903
MCCAIN, J. I., Due West, S. C.....	1906
MCCLINTOCK, NORMAN, 504 Amberson Ave., Pittsburgh, Pa.....	1900
MCCONNELL, HARRY B., Box 77, Cadiz, O.....	1904
MCCOOK, PHILIP JAMES, 15 William St., New York City.....	1895
McELHONE, Miss NELL K., 377 West End Ave., New York City.....	1905
McEWEN, DANIEL C., 160 Stirling Pl., Brooklyn, N. Y.....	1901
McHATTON, Dr. HENRY, Macon, Ga.....	1898
McILHENNY, EDWARD AVERY, Avery Island, La.....	1894
McKECHNIE, FREDERICK BRIDGHAM, Ponkapog, Mass.....	1900
McLAIN, ROBERT BAIRD, Market and 12th Sts., Wheeling, W. Va....	1893
McMILLAN, Mrs. GILBERT, Gorham, N. H.....	1902
McNEIL, Miss EMILY, Cromwell Hall, Cromwell, Conn.....	1905
McNULTY, HENRY A., 281 Fourth Ave., N. Y. City.....	1900
MEAD, Mrs. E. M., 2465 Broadway, New York City.....	1904
MEEKER, JESSE C. A., Box 163, Danbury, Conn.....	1899
MERRIAM, HENRY F., 94 New England Ave., Summit, N. J.....	1905
MERRILL, HARRY, Bangor, Maine.....	1883
MERSHON, W. B., Saginaw, Mich.....	1905
MILLER, JAMES HENRY, Lowville, N. Y.....	1904
MILLS, HARRY C., Box 218, Unionville, Conn.....	1897
MILLS, Prof. WILLIAM C., Ohio State Univ., Columbus, O.....	1900
MITCHELL, Dr. WALTON I., 321 Barnes Bldg., Wichita, Kans.....	1893

MONTGOMERY, THOMAS H., Jr., Univ. of Texas, Austin, Texas.	1899
MOORE, CLEMENT, 107 Euclid Ave., Hackensack, N. J.	1906
MOORE, Miss ELIZ. PUTNAM, 70 West 11th St., New York City.	1905
MOORE, ROBERT THOMAS, W. Main St., Haddonfield, N. J.	1898
MORCOM, G. FREAN, 1815 N. Raymond Ave., Pasadena, Cal.	1886
MORGAN, ALBERT, Hartford Fire Ins. Co., Hartford, Conn.	1903
MORGAN, T. A., 316 High St., Morgantown, W. Va.	1906
MORTON, Dr. HOWARD McILVAIN, 400 Andrus Bldg., Minneapolis, Minn.	1900
MOSHER, FRANKLIN H., Wakefield, Mass.	1905
MOSLE, Mrs. GEORGE R., Gladstone, Somerset Co., N. J.	1904
MUMMERY, EDWARD G., 24 E. Atwater St., Detroit, Mich.	1902
MURPHEY, Dr. EUGENE E., 444 Telfair St., Augusta, Ga.	1903
MURPHY, ROBERT C., Amer. Mus. Nat. Hist., N. Y. City.	1905
MYERS, Mrs. HARRIET W., 306 Ave. 66, Los Angeles, Cal.	1906
MYERS, Miss LUCY F., "Brookside," Poughkeepsie, N. Y.	1898
NASH, CHAUNCEY C., 245 Newbury St., Boston, Mass.	1906
NASH, C. W., 94 Lee Ave., Toronto, Ont.	1906
NASH, HERMAN W., Box 264, Pueblo, Colo.	1892
NEFF, CHARLES H., Portland, Conn.	1906
NELSON, JAMES ALLEN, 210 Mitchell St., Ithaca, N. Y.	1898
NEWMAN, Rev. STEPHEN M., 1818 M. St., N. W., Washington, D. C.	1898
NICHOLS, JOHN M., 46 Spruce St., Portland, Me.	1890
NICHOLS, JOHN TREADWELL, 42 W. 11th St., New York City.	1901
NOLTE, Rev. FELIX, St. Benedict's College, Atchison, Kan.	1903
NORRIS, J. PARKER, Jr., 2122 Pine St., Philadelphia, Pa.	1904
NORRIS, ROY C., 725 N. 10th St., Richmond, Ind.	1904
NOWELL, JOHN ROWLAND, Box 979, Schenectady, N. Y.	1897
NOYES, Mrs. HARRY A., Hyde Park, Vt.	1905
O'CONNOR, HALDEMAN, 25 N. Front St., Harrisburg, Pa.	1896
OGDEN, Dr. HENRY VINING, 141 Wisconsin St., Milwaukee, Wis.	1897
OLDYS, HENRY, Dept. of Agriculture, Washington, D. C.	1896
OLIVER, Dr. HENRY KEMBLE, 2 Newbury St., Boston, Mass.	1900
OWEN, Miss JULIETTE AMELIA, 306 N. 9th St., St. Joseph, Mo.	1897
PADDOCK, Miss ISABEL M., 14 Park St., St. Johnsbury, Vt.	1904
PAINE, AUGUSTUS G., Jr., 126 E. 39th St., New York City.	1886
PALMER, SAMUEL COPELAND, Swarthmore, Pa.	1899
PARKER, Hon. HERBERT, S. Lancaster, Mass.	1904
PATTEN, Mrs. JOHN D., 2212 R St., Washington, D. C.	1900
PEABODY, Rev. P. B., Blue Rapids, Kans.	1903
PEAVEY, ROBERT W., 791 Coney Island Ave., Brooklyn, N. Y.	1903
PECK, CLARK J., 6728 Leeds St., W. Philadelphia, Pa.	1904
PECK, HENRY O., 62 Pomeroy Ave., Pittsfield, Mass.	1904
PERRY, Dr. ELTON, 610 Baylor St., Austin, Tex.	1902
PERRY, GEORGE P., Sterling, Ill.	1905
PETERS, JAMES LEE, Walnut Ave., Jamaica Plain, Mass.	1904

PETERSON, CYRUS A., 8 Shaw Place, St. Louis, Mo.....	1904
PETTIS, Miss GRACE L., Museum Nat. Hist., Springfield, Mass.....	1903
PHELPS, Mrs. J. W., Box 36, Northfield, Mass.....	1899
PHILLIPS, ALEXANDER H., Princeton, N. J.....	1891
PHILLIPS, JOHN CHARLES, 299 Berkeley St., Boston, Mass.....	1904
PHILLIPS, SHERMAN E., Canterbury, N. H.....	1904
PIERCE, A. K., Renovo, Pa.....	1891
PIPER, STANLEY E., Biological Survey, Dept. Agriculture, Wash- ton, D. C.....	1906
PITCAIRN, WILLIAM G., 3330 Perrysville Ave., Allegheny, Pa.....	1906
POE, Miss MARGARETTA, 1500 Park Ave., Baltimore, Md.....	1899
POLLOCK, ADELAIDE L., Queen Anne School, Seattle, Wash.....	1906
POMEROY, HARRY KIRKLAND, Box 575, Kalamazoo, Mich.....	1894
POOLE, ALFRED D., 401 W. 7th St., Wilmington, Delaware.....	1901
POOLE, Miss GRACE L., 22 School St., Rockland, Mass.....	1906
PORTER, LOUIS H., Stamford, Conn.....	1893
PRAEGER, WILLIAM E., 421 Douglas Ave., Kalamazoo, Mich.....	1892
PRICE, JOHN HENRY, Crown W Ranch, Knowlton, Mont.....	1906
PROCTER, JAMES N., R. F. D. 2, Ventura, Cal.....	1904
PURDY, JAMES B., Plymouth, Mich.....	1893
RADCLIFFE, Mrs. WALLACE, 1200 K St., N. W., Washington, D. C....	1905
RALPH, JAMES R., 205 S. 7th St., Minneapolis, Minn.....	1906
RANN, Mrs. MARY L., Manchester, Iowa.....	1893
RAUB, Dr. M. W., 340 W. King St., Lancaster, Pa.....	1890
RAWSON, CALVIN LUTHER, Box 33, Norwich, Conn.....	1885
READ, ALBERT M., 1140 15th St. N. W., Washington, D. C.....	1895
REAGH, Dr. ARTHUR LINCOLN, 39 Maple St., West Roxbury, Mass....	1896
REDFIELD, Miss ELISA WHITNEY, 29 Everett St., Cambridge, Mass....	1897
REDINGTON, ALFRED POETT, Box 66, Santa Barbara, Cal.....	1890
REED, CHESTER A., 75 Thomas St., Worcester, Mass.....	1904
REED, Miss EMILY E., 12 Louisburg Sq., Boston, Mass.....	1904
REED, HUGH DANIEL, 804 E. Seneca St., Ithaca, N. Y.....	1900
REED, Mrs. WILLIAM HOWELL, Belmont, Mass.....	1904
REHN, JAMES A. G., Acad. Nat. Sciences, Philadelphia, Pa.....	1901
REMICK, J. A., Jr., 300 Marlboro St., Boston, Mass.....	1905
RHOADS, CHARLES J., Bryn Mawr, Pa.....	1895
RICHARDS, Miss HARRIET E., 36 Longwood Ave., Brookline, Mass....	1900
RICHARDSON, C. H., Jr., 435 S. El Molino Ave., Pasadena, Cal.....	1903
RICHARDSON, Miss HARRIET, 1864 Wyoming Ave., Washington, D.C....	1905
RICHARDSON, JOHN KENDALL, Wellesley Hills, Mass.....	1896
RIDGWAY, JOHN L., Chevy Chase, Md.....	1890
RIKER, CLARENCE B., Maplewood, N. J.....	1885
ROBERTS, JOHN T., JR., 350 Main St., Buffalo, N. Y.....	1906
ROBERTS, WILLIAM ELY, George School, Bucks Co., Pa.....	1902
ROBINSON, ANTHONY W., 409 Chestnut St., Philadelphia, Pa.....	1903
RODDY, Prof. H. JUSTIN, State Normal School, Millersville, Pa.....	1891

ROE, CHARLES M., Kenilworth, Ill.....	1906
ROGERS, CHARLES H., 109 Patton Hall, Princeton, N. J.....	1904
ROOSEVELT, FRANKLIN DELANO, Hyde Park, N. Y.....	1896
ROSS, GEORGE H., 23 West St., Rutland, Vt.....	1904
ROWLEY JOHN, 505 Everett Ave., Palo Alto, Cal.....	1889
SABINE, GEORGE K., 30 Irving St., Brookline, Mass.....	1903
SAGE, HENRY M., Menands Road, Albany, N. Y.....	1885
SAMPSON, WALTER BEHRNARD, 36 S. California St., Stockton, Cal...	1897
SANDS, AUSTIN LEDYARD, Greenough Place, Newport, R. I.....	1902
SANFORD, GEORGE ALDEN, 215 W. 23rd St., N. Y. City.....	1906
SANFORD, HARRISON, 65 W. 50th St., New York City.....	1905
SANFORD, DR. LEONARD C., 216 Crown St., New Haven, Conn.....	1902
SASS, HERBERT RAVENEL, 23 Legare St., Charleston, S. C.....	1906
SAVAGE, WALTER GILES, Monteer, Mo.....	1898
SCHMUCKER, DR. S. C., 610 S. High St., West Chester, Pa.....	1903
SCHUMACHER, BOWEN W., 107 Dearborn St., Chicago, Ill.....	1906
SCHWARZ, FRANK, 1520 Lafayette Ave., St. Louis, Mo.....	1904
SEABURY, JOSEPH S., Wellesley Hills, Mass.....	1906
SEISS, COVINGTON FEW, 1338 Spring Garden St., Philadelphia, Pa...	1898
SEVERSON, HENRY P., Winneconne, Wis.....	1902
SHATTUCK, EDWIN HAROLD, Granby, Conn.....	1898
SHAW, HOLTON A., 610 4th Ave., Grand Forks, N. Dakota.....	1898
SHEARER, AMON R., Mont Belvieu, Tex.....	1905
SHELDON, CHARLES, 515 Madison Ave., New York City.....	1905
SHOEMAKER, FRANK H., Care of Gen. Auditor U. P. R. R. Co., Omaha, Neb.....	1895
SHROSBREE, GEORGE, Public Museum, Milwaukee, Wis.....	1899
SHUMWAY, GEORGE, Galesburg, Ill.....	1906
SILLIMAN, HARPER, 562 5th Ave., New York City.....	1902
SMITH, BYRON L., 2140 Prairie Ave., Chicago, Ill.....	1906
SMITH, DR. CLARA, Utica State Hospital, Utica, N. Y.....	1906
SMITH, REV. FRANCIS CURTIS, Boonville, N. Y.....	1903
SMITH, G. WASHBOURNE, 97 Nassau St., N. Y. City.....	1906
SMITH, HORACE G., State House, Denver, Colo.....	1888
SMITH, DR. HUGH M., 1209 M St. N. W., Washington, D. C.....	1886
SMITH, LOUIS IRVIN, Jr., 3809 Chestnut St., Philadelphia, Pa.....	1901
SMITH, PHILO W., JR., Box 285, Eureka Springs, Ark.....	1903
SMITHSON, AUBREY F., Warrensburg, Mo.....	1906
SMYTH, Prof. ELLISON A., Jr., Polytechnic Inst., Blacksburg, Va...	1892
SNOW, Prof. FRANCIS H., Univ. of Kansas, Lawrence, Kan.....	1903
SNYDER, WILL EDWIN, 109 E. Mackie St., Beaver Dam, Wis.....	1895
SPAULDING, FRED B., Lancaster, N. H.....	1894
SPINNEY, HERBERT L., Seguin Light Station, Popham Beach, Me...	1900
STANTON, Prof. J. Y., 410 Main St., Lewiston, Me.....	1883
STARK, GILBERT M., 1027 N. Michigan Ave., Saginaw, Mich.....	1906
STEBBINS, Miss FANNIE A., 480 Union St., Springfield, Mass.....	1903

STEELE, JOHN H., 4010 Spruce St., West Philadelphia, Pa.....	1906
STEPHENSON, MRS. LOUISE MCGOWN, 806 College St., Helena, Ark. . .	1894
STEVENS, CAROLINE M., 52 Bowdoin St., Portland, Me.....	1906
STIGALL, BENNETT M., Manual Training High School, Kansas City, Mo.....	1906
STONE, CLARENCE F., Branchport, N. Y.....	1903
STONE, DWIGHT D., R. F. D. 3, Oswego, N. Y.....	1891
STRATTON-PORTER, MRS. GENE, Limberlost Cabin, Geneva, Ind.	1906
STURTEVANT, EDWARD, St. George's School, Newport, R. I.....	1896
STYER, MRS. KATHARINE R., Concordville, Pa.....	1903
SURFACE, PROF. HARVEY ADAM, State Zoölogist, Harrisburg, Pa....	1897
SWAIM, LORING T., 190 Brattle St., Cambridge, Mass.....	1905
SWAIN, JOHN MERTON, Farmington, Me.....	1899
SWALES, BRADSHAW HALL, Grosse Isle, Mich.....	1902
SWARTH, HARRY S., 356 Belden Ave., Chicago, Ill.....	1900
SWENK, MYRON H., 1821 O St., Lincoln, Neb.....	1904
SWEZEY, GEORGE, 61 Polk St., Newark, N. J.....	1901
TAVERNER, PERCY A., 55 Elmhurst, Highland Park, Mich.....	1902
TAYLOR, ALEXANDER O'DRISCOLL, 11 Frances St., Newport, R. I....	1888
TEST, CHARLES DARWIN, Golden, Colo.....	1906
TEST, DR. FREDERICK CLEVELAND, 4318 Grand Boulevard Chicago, Ill.....	1892
THOMAS, MISS EMILY HINDS, The Aldine Hotel, Chestnut St., Phila- delphia, Pa.....	1901
THOMPSON, MISS CAROLINE BURLING., 195 Blossom St., Wellesley, Mass.....	1900
THOMPSON, DR. MILLETT T., Clark University, Worcester, Mass.....	1904
THOMPSON, ROY, Cando, N. D.....	1905
TOPPAN, GEORGE L., 725 11th St., N. W., Washington, D. C.....	1886
TOWNSEND, WILMOT, 272 75th St., Brooklyn, N. Y.....	1894
TREGANZA, A. O., 62 Hooper Bldg., Salt Lake City, Utah.....	1906
TROTTER, WILLIAM HENRY, 36 N. Front St., Philadelphia, Pa.....	1899
TUDBURY, WARREN C., 47 W. 126th St., New York City.....	1903
TUFTS, LE ROY MELVILLE, "Thrushwood," Farmington, Me.....	1903
TURNER, HOWARD M., 28 Grays Hall, Cambridge, Mass.....	1903
TUTTLE, DR. CARL, Berlin Heights, Ohio.....	1890
TWEEDY, EDGAR, 336 Main St., Danbury, Conn.....	1902
UNDERWOOD, WILLIAM LYMAN, Mass. Inst. Technology, Boston, Mass.....	1900
VALENTINE, MISS ANNA J., Bellefonte, Pa.....	1905
VAN CORTLANDT, MISS ANNE S., Croton-on-Hudson, N. Y.....	1885
VAN NAME, WILLARD GIBBS, 121 High St., New Haven, Conn.....	1900
VAN NORDEN, WARNER MONTAGNIE, Jay Mansion, Harrison, N. Y....	1899
VAN SANT, MISS ELIZABETH, 2960 Dewey Ave., Omaha, Neb.....	1896
VARICK, MRS. WILLIAM REMSEN, 1015 Chestnut St., Manchester, N. H.	1900
VETTER, DR. CHARLES, 152 Second St., New York City.....	1898

VISHER, STEPHEN S., Forestburg, S. Dakota.....	1904
VOLKMAN, JULIUS T., Webster Grove, Mo.....	1906
WADSWORTH, CLARENCE S., Middletown, Conn.....	1906
WALES, EDWARD H., Hyde Park, N. Y.....	1896
WALKER, Dr. R. L., 355 Main Ave., Carnegie, Pa.....	1888
WALLINGSFORD, LEO, 216 E. Crippen St., Cadillac, Mich.....	1904
WALTER, HERBERT E., Dr., 53 Arlington Ave., Providence, R. I....	1901
WALTERS, FRANK, South Sandisfield, Mass.....	1902
WARD, HENRY L., 882 Hackett Ave., Milwaukee, Wis.....	1906
WARREN, Dr. B. H., Box 245, West Chester, Pa.....	1885
WARREN, EDWARD ROYAL, 20 W. Caramillo St., Colorado Springs, Colo	1902
WATSON, Miss SARAH R., 5128 Wayne St., Germantown, Philadelphia, Pa	1900
WEIR, J. ALDEN, Branchville, Conn.....	1899
WELLS, FRANK S., 916 Grant Ave., Plainfield, N. J.....	1902
WENTWORTH, IRVING H., Matchuala, E. de S. L. P., Mexico.....	1900
WEST, LEWIS H., Roslyn, N. Y.....	1887
WESTFELDT, GUSTAF REINHOLD, Box 601, New Orleans, La.....	1902
WETMORE, Mrs. EDMUND, 343 Lexington Ave., New York City.....	1902
WHEELER, EDMUND JACOB, 177 Pequot Ave., New London, Conn....	1898
WHEELER, JOHN B., East Templeton, Mass.....	1897
WHEELOCK, Mrs. IRENE G., 1040 Hinman Ave., Evanston, Ill.....	1902
WHITCOMB, Mrs. HENRY F., 721 Franklin Place, Milwaukee, Wis....	1897
WHITE, FRANCIS BEACH, 6 Phillips Place, Cambridge, Mass.....	1891
WHITE, GEORGE R., Dead Letter Office, Ottawa, Ont.....	1903
WHITE, W. A., 130 Water St., New York City.....	1902
WICKERSHAM, CORNELIUS W., Hastings 2, Cambridge, Mass.....	1902
WICKS, M. L., Jr., 620 L. A. Trust Bldg., Los Angeles, Cal.....	1890
WILBUR, ADDISON P., 60 Gibson St., Canandaigua, N. Y.....	1895
WILCOX, Dr. EMMA D., 307 W. 98th St., New York City.....	1905
WILCOX, T. FERDINAND, 115 W. 75th St., New York City.....	1895
WILDE, MARK L. C., 4909 Arch St., Philadelphia, Pa.....	1893
WILLARD, BERTEL G., Box 107, Millis, Mass.....	1906
WILLIAMS, J. BICKERTON, 236 Bloor St. E, Toronto, Ontario.....	1889
WILLIAMS, RICHARD FERDINAND, Box 521, New York City.....	1902
WILLIAMS, ROBERT S., New York Botanical Gardens, Bronx Park, New York City.....	1888
WILLIAMS, ROBERT W., Jr., U. S. Dept. of Agriculture, Washington, D. C.	1900
WILLIAMSON, E. B., Bluffton, Ind.....	1900
WILSON, SIDNEY S., German American Bank Bldg., St. Joseph, Mo....	1895
WINSLETT, Miss MARY E., Stevensville, Mont.....	1904
WISLER, J. JAY, 231 Cherry St., Columbia, Pa.....	1903
WISTER, WILLIAM ROTCH, 505 Chestnut St., Philadelphia, Pa.....	1904
WITHERBEE, Mrs F. B., 106 Berkeley St., West Newton, Mass.....	1906

WOLFE, WILLIAM EDWARD, Box 7, Wray, Colo.....	1900
WOOD, J. CLAIRE, 179 17th St., Detroit, Mich.....	1902
WOOD, NELSON R., Smithsonian Institution, Washington, D. C....	1895
WOOD, NORMAN A., 1216 S. University Ave., Ann Arbor, Mich.....	1904
WOOD, S. T., 229 Beverley St., Toronto, Ont.....	1904
WOODCOCK, ARTHUR ROY, Corvallis, Oregon.....	1901
WOODRUFF, EDWARD SEYMOUR, 14 E. 68th St., New York City.....	1899
WOODRUFF, FRANK M., Acad. Sciences, Chicago, Ill.....	1904
WOODRUFF, LEWIS B., 14 E. 68th St., New York City.....	1886
WOODWORTH, MRS. NELLY HART, 41 Bank St., St. Albans, Vt.....	1894
WORTHEN, CHARLES K., Box 103, Warsaw, Ill.....	1891
WORTHINGTON, WILLIS W., Shelter Island Heights, N. Y.....	1889
WRIGHT, ALBERT H., 325 Dryden Road, Ithaca, N. Y.....	1906
WRIGHT, HORACE WINSLOW, 82 Myrtle St., Boston, Mass.....	1902
WRIGHT, SAMUEL, Conshohocken, Pa.....	1895
ZAPPEY, WALTER R., 19 Norfolk St., Roslindale, Mass.....	1905
ZERRAHN, CARL OTTO, Milton, Mass.....	1904

DECEASED MEMBERS.

FELLOWS.

	<i>Date of Death.</i>
BAIRD, SPENCER FULLERTON.....	Aug. 19, 1887
BENDIRE, CHARLES E.	Feb. 4, 1917
COUES, ELLIOTT.....	Dec. 25, 1899
GOSS, N. S.....	March 10, 1889
HOLDER, JOSEPH B.....	Feb. 28, 1888
JEFFRIES, JOHN AMORY.....	March 26, 1892
McILWRAITH, THOMAS.....	Jan. 31, 1903
MERRILL, JAMES C.....	Oct. 27, 1902
SENNETT, GEORGE BURRITT.....	March 18, 1900
TRUMBULL, GURDON.....	Dec. 28, 1903
WHEATON, JOHN M.....	Jan. 28, 1887

HONORARY FELLOWS.

BLANFORD, WILLIAM T.....	June 23, 1905
BURMEISTER, HERMANN.....	May 1, 1892
CABANIS, JEAN.....	Feb. 20, 1906
GÄTKE, HEINRICH.....	Jan. 1, 1897

GUNDLACH, JUAN.....	March 14, 1896
GURNEY, JOHN HENRY.....	April 20, 1890
HARTLAUB, GUSTAV.....	Nov. 20, 1900
HUXLEY, THOMAS H.....	June 29, 1895
KRAUS, FERDINAND.....	Sept. 15, 1890
LAWRENCE, GEORGE N.....	Jan. 17, 1895
MILNE-EDWARDS, ALPHONSE.....	April 21, 1900
NEWTON, ALFRED.....	June 7, 1907
PARKER, WILLIAM KITCHEN.....	July 3, 1890
PELZELN, AUGUST VON.....	Sept. 2, 1891
SALVIN, OSBERT.....	June 1, 1898
SCHLEGEL, HERMANN.....	Jan. 17, 1884
SEEBOHM, HENRY.....	Nov. 26, 1895
TACZANOWSKI, LADISLAS.....	Jan. 17, 1890

CORRESPONDING FELLOWS.

ALTUM, C. A.....	Jan. 1, 1900
ANDERSON, JOHN.....	Aug. 16, 1900
BALDAMUS, EDUARD.....	Oct. 30, 1893
BLAKISTON, THOMAS W.....	Oct. 15, 1891
BOGDANOW, MODEST N.....	March 4, 1888
BRYANT, WALTER, E.....	May 21, 1905
BULLER, WALTER LAWRY.....	July 19, 1906
COOPER, JAMES G.....	July 19, 1902
CORDEAUX, JOHN.....	Aug. 1, 1899
DAVID, ARMAND.....	Nov. 10, 1900
FATIO, VICTOR.....	March 19, 1906
HAAST, JULIUS VON.....	Aug. 15, 1887
HARGITT, EDWARD.....	March 19, 1895
HOLUB, EMIL.....	Feb. 21, 1902
HOMEYER, E. F. VON.....	May 31, 1889
LAYARD, EDGAR LEOPOLD.....	Jan. 1, 1900
LEVERKÜHN, PAUL.....	Dec. 5, 1905
LYTTLETON, THOMAS, LORD LILFORD.....	June 17, 1896
MARSCHALL, A. F.....	Oct. 11, 1887
MALMGREN, ANDERS JOHAN.....	April 12, 1897
MIDDENDORFF, ALEXANDER THEODORE VON.....	Jan. 28, 1894
MOSJISOVICS, F. G. HERMANN AUGUST.....	Aug. 27, 1897
OSTALET, EMILE.....	Oct. 23, 1905
PHILIPPI, R. A.....	Aug. — 1904
PREJEVALSKI, N. M.....	Oct. 20, 1887
PRENTISS, D. WEBSTER.....	Nov. 19, 1899
PRYER, HARRY JAMES STOVIN.....	Feb. 17, 1888

RADDE, GUSTAV FERDINAND.....	— 1903
SCHRENCK, LEOPOLD VON.....	Jan. 20, 1894
SÉLEYS-LONGSCHAMPS, EDMOND DE.....	Dec. 11, 1900
SEVERTZOW, N.....	Feb. 8, 1885
STEVENSON, HENRY.....	Aug. 18, 1888
TRISTRAM, H. B.....	March 8, 1906
WHARTON, HENRY T.....	Sept. —, 1895
WOODHOUSE, SAMUEL W.....	Oct. 23, 1904

MEMBERS.

FANNIN, JOHN.....	June 20, 1904
JUDD, SYLVESTER D.....	Oct. 22, 1905
RALPH, WILLIAM LeGRANGE.....	July 8, 1907

ASSOCIATES.

ADAMS, CHARLES F.....	May 20, 1893
ALLEN, CHARLES SLOVER.....	Oct. 15, 1893
ANTES, FRANK T.....	Feb. 6, 1907
ATKINS, H. A.....	May 19, 1885
AVERY, WILLIAM CUSHMAN.....	March 11, 1894
BAILEY, CHARLES E.....	—, 1905
BARLOW, CHESTER.....	Nov. 6, 1902
BAUR, GEORGE.....	June 25, 1898
BECKHAM, CHARLES WICKLIFFE.....	June 8, 1888
BILL, CHARLES.....	April —, 1897
BIRTWELL, FRANCIS JOSEPH.....	June 29, 1901
BOARDMAN, GEORGE A.....	Jan. 11, 1901
BOLLES, FRANK.....	Jan. 10, 1894
BRACKETT, FOSTER H.....	Jan. 5, 1900
BREESE, WILLIAM L.....	Dec. 7, 1889
BRENINGER, GEORGE FRANK.....	Dec. 3, 1905
BRENNAN, CHARLES F.....	Mar. 21, 1907
BROKAW, L. W.....	Sept. 3, 1897
BROWN, JOHN CLIFFORD.....	Jan. 16, 1901
BROWNE, FRANCIS CHARLES.....	Jan. 9, 1900
BURNETT, LEONARD E.....	March 16, 1904
CAIRNS, JOHN S.....	June 10, 1895
CALL, AUBREY BRENDON.....	Nov. 20, 1901
CAMPBELL, ROBERT ARGYLL.....	April —, 1897
CANFIELD, J. B.....	Feb. 18, 1904
CARTER, EDWIN.....	— 1900
CLARK, JOHN N.....	Jan. 13, 1903

COLBURN, W. W.	Oct. 17, 1899
COLLETT, ALONSO M.	Aug. 22, 1902
CORNING, ERASTUS, JR.	April 9, 1893
COE, W. W.	April 26, 1885
DAFFIN, WM. H.	April 21, 1902
DAKIN, JOHN A.	Feb. 21, 1900
DEXTER, NEWTON	July 27, 1901
ELLIOTT, S. LOWELL	Feb. 11, 1889
FAIRBANKS, FRANKLIN	April 24, 1895
FOWLER, J. L.	July 11, 1899
GESNER, A. H.	April 30, 1895
Goss, BENJAMIN F.	July 6, 1893
HATCH, JESSE MAURICE	May 1, 1898
HODLEY, FREDERIC H.	Feb. 26, 1895
HOLMES, LARUE KLINGLE	May 10, 1906
HOOPES, JOSIAH	Jan. 16, 1904
HOWLAND, JOHN SNOWDON	Sept. 19, 1885
INGERSOLL, JOSEPH CARLETON	Oct. 2, 1898
JENKS, JOHN W. P.	Sept. 27, 1894
JESURUN, MORTIMER	March —, 1905
JOUY, PIERRE LOUIS	March 22, 1894
KNIGHT, WILBUR CLINTON	July 8, 1903
KNOX, JOHN C.	July 9, 1904
KNOX, JOHN COWING	June 1, 1904
KOCH, AUGUST	Feb. 15, 1907
KUMLIEN, LUDWIG	Dec. 4, 1902
KUMLIEN, THURE	Aug. 5, 1888
LAWRENCE, ROBERT HOE	April 27, 1897
LINDEN, CHARLES	Feb. 3, 1888
LLOYD, ANDREW JAMES	June 14, 1906
MABBETT, GIDEON	Aug. 15, 1900
MARBLE, CHARLES C.	Sept. 25, 1900
MARCY, OLIVER	March 19, 1899
MARIS, WILLARD LORRAINE	Dec. 11, 1895
McKINLAY, JAMES	Nov. 1, 1899
MEAD, GEORGE S.	June 19, 1901
MINOT, HENRY DAVIS	Nov. 13, 1890
MORRELL, CLARENCE HENRY	July 15, 1902
NICHOLS, HOWARD GARDNER	June 23, 1896
NIMS, LEE	March 12, 1903
NORTHROP, JOHN I.	June 26, 1891
PARK, AUSTIN F.	Sept. 22, 1893
PAULMIER, FREDERICK CLARK	March 3, 1906
POMEROY, Miss GRACE V.	May 14, 1906
RAGSDALE, GEORGE H.	March 25, 1895
READY, GEORGE H.	March 20, 1903

RICHARDSON, JENNESS.....	June 24, 1893
ROBINS, MRS. EDWARD.....	July 2, 1906
SAND, ISABELLA LOW.....	April 20, 1906
SELOUS, PERCY SHERBORN.....	April 7, 1900
SLATER, JAMES H.....	Feb. —, 1895
SLEVIN, THOMAS EDWARDS.....	Dec. 23, 1902
SMALL, EDGAR A.....	April 24, 1884
SMITH, CLARENCE ALBERT.....	May 6, 1896
SOUTHWICK, JAMES M.....	June 3, 1904
STOWE, W. H.....	March—, 1895
SWEIGER, MRS. J. L.....	March 23, 1907
THORNE, PLATTE M.....	March 16, 1897
THURBER, E. C.....	Sept. 6, 1896
VENNOR, HENRY G.....	June 8, 1884
WATERS, EDWARD STANLEY.....	Dec. 26, 1902
WILLARD, SAMUEL WELLS.....	May 24, 1887
WOOD, WILLIAM.....	Aug. 9, 1885
YOUNG, CURTIS C.....	July 30, 1902

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Series,
Vol. XXXII

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New
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Vol. XXIV

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CONTENTS.

	PAGE
SUMMER BIRD-LIFE OF THE NEWARK, NEW JERSEY, MARSHES. By Clinton G. Abbott. (Plate I)	1
NOTES ON THE SPRING BIRDS OF TISHOMINGO COUNTY, MISSISSIPPI. By Andrew Allison	12
THE RIO GRANDE SEEDEATER, ITS STATUS AND TECHNICAL HISTORY. By J. A. Allen	26
THE EASTERN FORMS OF GEOTHYLIS TRICHAS. By Frank M. Chapman	30
NOTES ON THE EARLY LIFE OF LOON CHICKS. By C. William Beebe. (Plate II)	34
BACHMAN'S WARBLER BREEDING IN LOGAN COUNTY, KENTUCKY. By G. C. Embody	41
THE NEST AND EGGS OF BACHMAN'S WARBLER, <i>Helminthophila bachmani</i> (AUD.), TAKEN NEAR CHARLESTON, SOUTH CAROLINA. By Arthur T. Wayne	43
UNPUBLISHED LETTERS OF JOHN JAMES AUDUBON AND SPENCER F. BAIRD. By Ruthven Deane	53
BIRDS OF TORONTO, CANADA. II. LAND BIRDS. By James H. Fleming.	71
TWENTY-FOURTH CONGRESS OF THE AMERICAN ORNITHOLOGISTS' UNION. By John H. Sage	89

GENERAL NOTES.—Capture of the Glaucous Gull (*Larus glaucus*) in Boston Harbor, Mass., 94; Recent Occurrence of the European Teal and the Marbled Godwit near Portland, Maine, 94; Baird's Sandpiper at Newfound Lake, Hebron, N. H., 94; Another Limpkin (*Aramus giganteus*) in South Carolina, 95; Note on the Clapper Rail in Maine, 95; A Wounded Sora's Long Swim, 96; A Florida Gallinule on the Coast of Massachusetts, 97; The Short-eared Owl and Savanna Sparrow Breeding in Wayne County, Michigan, 97; The Breeding Habits of *Empidonax virescens* in Connecticut, 99; *Empidonax griseus* Brewster vs. *Empidonax canescens* Salvin and Godman, 99; The Raven near Portland, Maine, 100; Two Ravens (*Corvus corax principalis*) Seen at Harpswell, Maine, 100; The Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) in Georgia, 100; A new Colorado Record for the White-winged Crossbill (*Loxia leucoptera*), 101; An Early Date for the Arrival of the Ipswich Sparrow (*Passerculus princeps*) on the Coast of South Carolina, 101; Macgillivray's Seaside Sparrow (*Ammodramus maritimus macgillivrayi*) with Fourteen Rectrices, 102; The Junco Breeding at Wellfleet, Mass., 102; A New White-throat Song, 102; Scarlet Tanager (*Piranga erythromelas*) at Ottawa, Canada, 103; The Nesting of *Stelgidopteryx serripennis* in Norwich, Vt., 103; A New Hampshire Record for *Stelgidopteryx serripennis*, 104; The Philadelphia Vireo (*Vireo philadelphicus*) in Georgia, 104; Connecticut Warbler in Maine, 105; *Cinclus mexicanus* not a Costa Rican Bird, 105; A Carolina Wren in Middlesex Fells, Massachusetts, 105; Some Corrected Records, 106; Rare Northern Birds near Chicago, Ill., 107; Telescope Observations of Migrating Birds, 107; A Migration Disaster in Western Ontario, 108; Early Appearance of Certain Northern Species at Ottawa, Canada, 110; Audubon's Ornithological Biography, 111.

RECENT LITERATURE.—Beebe's 'The Bird,' 112; Hellmayr on Spix's Types of Brazilian Birds, 113; Thayer and Bangs on Sonoran Birds, 114; Lönnberg on the Birds of South Georgia, 115; Harvie-Brown's 'A Fauna of the Tay Basin,' 115.

CORRESPONDENCE.—The Concilium Bibliographicum as a Bureau of Ornithological Information, 117.

NOTES AND NEWS.—Obituary: William Thomas Blanford, 118; Walter Lawry Buller, 119. The Revision of the Code of Nomenclature, etc. 119; Second Annual Meeting of National Association of Audubon Societies, 120; Important Change of Address, 120.

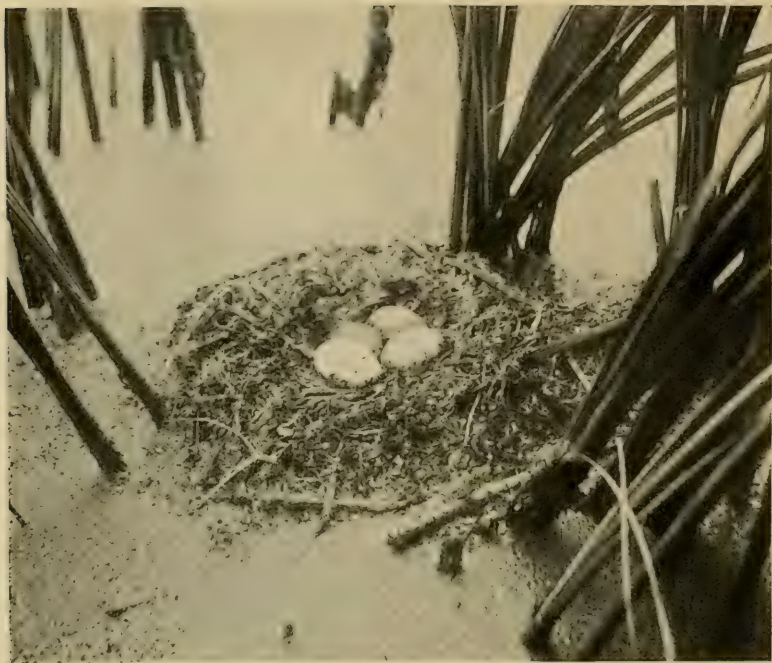
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NEST AND EGGS OF PIED-BILLED GREBE, NEWARK MARSHES, N. J., JUNE 17, 1906.
Photographed by C. G. Abbott.



NEST, EGGS, AND NEWLY HATCHED YOUNG OF FLORIDA GALLINULE, NEWARK
MARSHES, N. J., JUNE 17, 1906. Photographed by C. G. Abbott.

THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XXIV.

JANUARY, 1907.

No. 1.

SUMMER BIRD-LIFE OF THE NEWARK, NEW JERSEY, MARSHES.

BY CLINTON G. ABBOTT.

Plate I.

It is not the good fortune of every bird-lover to be able to visit the swamps of North Dakota, or even the more famous bird resorts nearer home; but that bird-life of scientific interest can be found within easy reach, and often in places where it would be least expected, I think the present paper will show.

There is a small group of bird-lovers, centering chiefly about the Linnæan Society of New York, who are closely confined by business in the city and whose ornithological investigations are therefore limited mostly to a small portion of the suburban district. The region has been fairly well scoured, but no experiences have been more interesting than the discoveries of the past summer in the Newark marshes, which lie within seven miles of New York City Hall, and are readily accessible within the limits even of an ordinary Saturday afternoon 'half holiday.'

These marshes, known sometimes as the Hackensack Meadows, are very extensive in their entirety, and are familiar to every one who has entered New York by train from the West. But it is only with a comparatively small area that this paper deals—a tract of not more than 100 acres. The bird-life of this spot proved to be so very interesting that there was no temptation to search further, the especially notable fact being the surprising numbers of Florida Gallinules (*Gallinula galeata*) that were found nesting here.

My first suspicion that the Florida Gallinule might be a nesting species about New York was when I heard that a bird of this species had been shot by two boys on the mill-pond at Bristol, Pa., in early September, 1899, and taken for identification to Dr. Joseph Abbott of that place. On September 7, 1902, I spent an afternoon exploring the Bristol mill-pond, but found no trace of Gallinules.

On May 28, 1904, while entering the Jersey City yards in a train of the Central Railroad of New Jersey, I had an admirable view of a Gallinule swimming in a small patch of rushes close to the track-side. I spoke to Dr. William C. Braislin of Brooklyn about the bird and on July 15, 1905, was invited to accompany him in exploring a similar situation close to the terminal of the Long Island Railroad in Long Island City, where the presence of Florida Gallinules was first discovered by Messrs. W. F. and John Hendrickson. Here we found the birds in numbers, with ample evidences of their nesting, as fully described by Dr. Braislin in 'The Auk,' Volume XXIII, 1906, page 189.

My interest in the possibilities of trackside swamps was by this time fully aroused and in my daily commutings over the main line of the Central Railroad of New Jersey I was constantly on the alert for further signs of the Gallinules. On August 4, 1905, an accident on the main line of the railroad caused the trains of that line to be dispatched by way of Newark, and a close watch of the new territory was rewarded by the sight of a number of dark colored birds swimming in a patch of open water at the point where the Newark-Elizabethport Branch crosses the Philadelphia and Reading freight tracks. I told my friends of the incident, and on Decoration Day, May 30, 1906, Messrs. H. H. Hann and J. P. Callender visited the place. The account they brought back was certainly enough to arouse the enthusiasm of the most callous ornithologist. Not only had they seen the Gallinules in numbers, and discovered both their eggs and young, but they also found three nests of the Least Bittern (*Ardetta exilis*) containing eggs, as well as one of the comical little fuzzy young birds. Furthermore they reported the presence of the American Coot (*Fulica americana*), two of which had been seen swimming in the open water.

My next available holiday, which was not till Saturday, June 16, was promptly set aside for a visit to the marshes, when Mr. Hann

was my companion. In order to make as thorough an investigation as possible, Saturday afternoon and the whole of Sunday were given up to the work, the night being spent at Newark. Mr. Callender joined us on Sunday morning.

The particular spot where the birds seemed to be most abundant, and to which our activities were confined, is best reached by walking along the railroad from Newark. In fact it is bounded on three sides by tracks, two of which are busy lines with constantly passing or shunting trains. It was certainly not a place where one would expect to look for a profusion of marsh-birds, which have a reputation for shyness and seclusion. Engineers and others about the place were found to be familiar with the birds, classing them under the general name of 'mud-hens.'

On the railroad tracks we could constantly hear the harsh cries of the Gallinules from among the reeds close by, and when we reached a spot which commands a view of open water many birds were seen swimming. With the aid of prism binoculars we plainly identified a Coot among them, and what was even more gratifying, several birds which were at once recognized as Pied-billed Grebes (*Podilymbus podiceps*), a species not observed by Messrs. Hann and Callender on their first visit. As we emerged from an old barn which we used for changing our clothes, we observed a Black-crowned Night Heron flying lazily over the swamp, with what appeared to be an eel dangling from its claws. The bird seemed to provide the last necessary suggestion of wildness to our urban hunting-ground, and helped to drive from our imaginations the presence of factories and city blocks only a few hundred yards away.

The water in the swamp was found to be about thigh deep, that is to say the wader sank that distance, but fully half the apparent depth was caused by the soft mud under the water. Occasionally, one would step into a hole up to his chest, but this was unusual, and for the most part the ground under the mud was solid and trustworthy. The area searched consisted of a broad tract of open water, containing a few islands, and bordered on the one side by the railroad track and on the other by a luxuriant growth of cat-tails into which many arms and bays extended. In addition there were among the cat-tails a number of isolated ponds unconnected with the main tract. All water, with the exception of the center of

the open tract, was covered with a solid scum of duckweed so thick that swimming birds left no path in it, as it closed immediately in their wake. The cat-tails often extended at least two feet above the wader's head, so that in a thick bed it would have been easy to lose one's bearings were it not for the tall chimney of a Bluing Factory close by — evidence in itself of the proximity of civilization to the marsh birds' haunt.

The result of our day and a half in the swamp was most gratifying. With the exception of the Coot we found the nest of every species we hoped for, and others beside. Long-billed Marsh Wrens (*Telmatodytes palustris*) were the most abundant birds found. Their nests were hanging in the cat-tails almost like some sort of fruit, and one tired of sticking his finger into them as he pushed them from his path.

Next in numbers were without doubt the Gallinules, whose strident notes, consisting chiefly of a sharp monosyllable or a laugh-like cackle, were continually in our ears. Mr. Hann and I found no less than seven inhabited nests the first afternoon and at least three times as many empty ones. The inhabited nests contained anywhere from ten eggs to one young bird. The nests themselves, which are composed entirely of dead rushes with but a shallow cup, are usually placed in an isolated tussock or else at the edge of a cat-tail bed, so that the bird when leaving may have immediate access to open water. A notable exception, however, was a nest found in a dense growth of cat-tails, at least twelve feet from open water. In the majority of cases the bed of the nest was four to six inches from the surface of the water, but several, perhaps built by birds whose first nests had been flooded, were higher. Almost every nest had a sort of sloping runway to the water's edge by which the bird probably always entered and left the nest. One nest was especially worthy of notice for its unusual height above the water, as we could barely see into it when standing on tiptoe in the mud. It was placed high on a mass of cat-tails tangled by the wind. Occasionally the tips of the rushes were drawn together to form a sort of arch over a nest, as is done by rails, but this was by no means universal.

The Gallinules' eggs are of a brownish buff ground color, speckled and blotched with reddish brown and umber. No prettier

sight could be desired than a large clutch of these handsome eggs resting on their bed of dull brown, and surrounded by the brilliant green of the cat-tails and duckweed. The measurements of a set of eight collected varied in length from 1.67 to 1.76 inches by 1.19 to 1.22 inches in width. The newly hatched Gallinule is certainly a most absurd looking little creature. The black down which covers his body, instead of being soft and warm, is coarse and hair-like. On the cheeks and throat every filament is tipped with white which only adds to the ludicrous effect. The top of the little fellow's head is nearly bald, and the skin at the base of the bill is of a bright red color, altogether a poor suggestion of the handsome shield with which the forehead of the adult bird is adorned. In more mature young birds the frontal plate is rudimentary and pale in color, and this, together with a grayish tinge to the neck and breast, render birds of the year easily distinguishable. Young Gallinules swim almost as soon as they are hatched. I was preparing to photograph a nest containing four pipped eggs and two young so recently hatched that shells were still in the nest. But before I could set up my camera one of the little fellows had scrambled out and started swimming in the direction of his mother. She would cluck to him like an old hen and he would answer with low peeping notes. Later I found him back in the nest.

Of the habits of the old Gallinules, I was able, with the increased material at hand, to corroborate and amplify my observations in the Long Island City swamps. In swimming, every stroke is accompanied by a very marked forward bob of the head, an act which I thought was perhaps an assistance to progression in the complete absence of webbed feet. Gallinules do not paddle after the manner of a duck, but seem to attempt to stride through the water. More than once the feet of both old and young birds were seen to come above the surface of the duckweed in front of the swimming bird. The tips of the wings are raised and crossed in swimming, but when the bird is standing they are folded down against the body. Like all other birds, the Gallinule becomes more courageous as its eggs near hatching. Usually the incubating bird had slipped away unseen before we even discovered her nest. But in the case of the nest containing both eggs and newly hatched young, the sitting bird allowed an approach to within about ten feet, and then

stayed close by, calling anxiously. In fact so bold did this bird show herself to be that I resolved to attempt to photograph her on her nest. It was very late in the afternoon and little time could be spent concealing the camera. But nevertheless, almost as soon as I had hidden myself in a neighboring bed of rushes, the bird showed herself, and in twenty minutes I had made an exposure. The light, however, in the meantime had become so very poor that the plate was hopelessly underexposed, though the faint image it contains is at least proof that it would be by no means an impossibility to photograph the shy Gallinule at home. The bird's actions about her nest interested me. Her note of anxiety was a strident *keek*, which she maintained ceaselessly at intervals of a few seconds, as she walked nervously about the reeds behind her nest. Each *keek* was accompanied by a spasmodic flirt of the tail; the bird also kept constantly turning and jerking her head. All her movements were most sedate and dignified and at each step the feet were raised daintily and the toes closed. But what surprised me most was that the bird continued her anxious calling even when seated upon the nest, an action which I have observed in no other bird; in the case of sparrows and the like, a cessation of the 'chipping' is often a sign that the bird is back on her nest. The Gallinule did not seem to hear the click of the shutter, but when, by continued pulling of the thread, I caused surrounding reeds to sway, she scrambled precipitately off her nest.

Our first acquaintance with the home life of the Pied-billed Grebe was made through the discovery of a bird, who could not have been more than a few hours old, but who was already an adept at diving. Indeed it was very difficult to follow him as he made quite extended swims under the duck-weed. He was a sleek and strangely striped little creature, suggesting somehow both in form and markings a peculiar fitness for his submarine excursions. He was quite alone when found, neither brothers and sisters nor parents being seen anywhere about. But close by was an empty Grebe's nest which he had doubtless just left. Not long afterwards a Grebe was spied sitting upon her nest in a sparse growth of rushes. She did not, however, allow a closer approach than fifty feet before ducking over the edge and disappearing without waiting to cover up her three eggs. This nest was discovered

on Saturday afternoon. When visited again on Sunday morning, it contained four eggs, all neatly covered. The last egg was clean and of a chalky, bluish-white color, easily distinguishable from the others, which were already stained and discolored from the soaking weeds used by the mother to conceal them. I uncovered the eggs to photograph them, and left the camera near the nest for a time in the hope of a possible camera shot. But I do not believe that the bird returned to her nest all day, although once or twice she was seen swimming uneasily about in the water some distance away. The Pied-billed Grebe, I am sure, would be a very difficult bird to photograph on her nest.

During the day we found another Grebe's nest containing one egg, two containing broken shells, and several empty nests. In addition there were at least two Grebe families swimming about in the open water. Unobserved among the cat-tails, we watched for some time one old bird solicitously caring for her five young. We observed the bird's habit of lowering itself in the water on suspicion of danger, and in one instance were treated to the pretty sight of the mother carrying a youngster on her back.

Both American Bitterns (*Botaurus lentiginosus*) and Least Bitterns (*Ardeetta exilis*) inhabit the swamp, and on June 17 we found a nest of each of them, to both of which mere good luck led us, in the midst of dense and pathless cat-tail areas. The American Bittern's nest, which was merely a dry platform carelessly constructed at the foot of the rushes, contained five eggs. The Least Bittern's had but one egg. One of the Least Bittern's nests found by Messrs. Hann and Callender on Decoration Day varied from the typical form as found on June 17; for instead of being suspended in the tall cat-tails, it was situated in the top of a tuft of sedges which was growing on a large floating bog. It was open to the sky and almost surrounded by open water. The nest of June 17, was to my mind the most picturesque of the marsh nests seen. The bed of dry rushes, upon which the eggs lie, was placed within a pretty basket of living green reeds, complete even to the handle, as it were, which was formed by drawing together the tops of the cat-tails above the nest.

Least Bitterns were far more numerous than their larger cousins; for while we found several of the smaller birds' nests, and undoubt-

edly missed dozens more, we were inclined to believe that we had found the nest of the only pair of American Bitterns in that part of the swamp. Least Bitterns were not infrequently to be seen on the wing, and toward evening especially seemed inclined to indulge in constitutional flights above the reed tops, where with head drawn back and legs extended to the rear, they would attain considerable headway. They were evidently unaccustomed to human invasion of their retreat, and on coming suddenly upon one of our party, would utter a harsh sibilant note and turn quickly in their course.

With the Coots we made but slight acquaintance. I doubt if there were more than two pairs in the part of the marsh we searched, and we did not find their nests. But there was no doubt of their existence there, as the white shield on their forehead forms a conspicuous field mark, and we identified the birds positively a number of times. Once two birds were seen together. At another time a Coot was seen swimming close to a Gallinule, when the difference between the birds was very marked. The Coot, beside its larger size and darker color, swims higher out of the water and in a different manner from the Gallinule. Continuing the comparison, it might be said that the Gallinule swims at the greatest 'angle' with the water, the tail being raised very high and the forward part of the body dipped so low that the water seems almost to meet over the base of the bird's neck. The Coot swims with less of a tilt, while of the three the plane of the Grebe's back is the nearest parallel with the water.

In the way of miscellaneous birds mention should be made of the Red-winged Blackbirds (*Agelaius phoeniceus*) which of course, together with their nests, were abundant in the swamp; also of a Swamp Sparrow's (*Melospiza georgiana*) nest with four eggs found in a bunch of dead cat-tails. Once a Green Heron (*Butorides virescens*) visitor was seen. Then we found a nest containing eggshells, which we put down to the Virginia Rail (*Rallus virginianus*). We took home the largest of the shells for identification, and all evidences seemed to point to this bird, which must undoubtedly have existed in the marsh, although we did not actually see it. But it seemed to us that the one feature lacking to carry us in imagination thoroughly into the heart of some western bird-swamp was the presence of a member of the duck family. Nor were we to be dis-

appointed long, for on coming suddenly upon one of the isolated ponds, we saw, to our astonishment, a duck swimming. It made a short flight above our heads and then tried to hide in the rushes. Mr. Hann plunged wildly after it, and smashing the reeds about its head triumphantly produced a Lesser Scaup Duck (*Aythya affinis*). Its presence here at this date was quickly accounted for by the condition of one of its wings which had evidently been badly wounded last shooting season. Even so, how it had found its way to the marsh remained a mystery. At all events after securing its photograph we let it go.

Other visits to the marsh, each resulting in a few more nests and a little more data, were made by Messrs. Hann and Callender on June 23, by Messrs. Hann, Callender and Dr. H. F. Merriam on July 1, and by Messrs. Hann and W. DeW. Miller on August 5. This last visit was largely for the purpose of making a more quiet and minute study of the habits of the birds, as it was by this time late for nests. Mr. Hann wrote me afterwards a letter which contained the following additional information:

"We were surprised at the numbers of the Gallinules. We saw at least fifty separate birds in the open, and counted as many as twenty-eight in a single pool. We saw several of them standing on small tussocks, and when so doing the tarsus was almost perpendicular while the tibia was held at an angle of about forty degrees with the line of the tarsus. One bird we noted stood for twenty minutes on a small tussock not more than six inches across, and besides preening his feathers he would every now and then peck at the duck-weed round about. After a while he got up and flew off with short, moderately quick wing beats and legs dangling down like a rail; he did not rise more than three feet above the water.

"We observed one odd incident. As you know, some of the floating bogs are very unsteady and turn over easily. We saw a Gallinule swim up to a small bog of this sort and as he stepped on the edge, it tilted under his weight. Instead of getting off as one would expect, he simply walked forward, turning it over and at the same time picking at the duckweed on it. I should say that he turned it completely over at least four or five times while I was looking at him through the glasses, and he was so near that I could see every move he made. At times it seemed as if he would lose

his balance and have to step off, but he persistently kept at his game, and it really appeared to me that he did it more for the fun than for what he was getting in the way of food.

"In feeding on the water I never saw the Gallinules dive completely under the surface like the Grebes; they simply ducked their heads under. On such occasions it was a common thing to see them bring up a large bunch of duckweed and pick at certain places as though they were looking for insects or snails. Once I observed four birds at the same time busily engaged in drawing the duckweed toward their bodies and turning it over with their bills in this way. Occasionally, however, we saw the birds swallow large pieces of the duckweed, roots and all, so they evidently also fed upon the weed itself.

"In caring for their young the Gallinules pass food to them if they are very small, but in no case place it in their bills. The older youngsters find their own food altogether. Both parents apparently tend the young, for we saw one family of seven very young birds with two adults getting food for them, and these were the only two out of a number round about which showed any interest in the youngsters.

"We found three dead birds, one adult and a downy young, floating close to each other in one of the pools, and a dead adult on the railroad tracks. One adult was found to have started moulting. All the Gallinules' nests seen were empty. But some of the Grebes were still mating, at least so we interpreted the action of a couple of birds who were playing with and chasing each other. One of them would at times dive and, swimming under water, come up beside the other. Then they would fly after each other so close to the water that their feet patted on the surface. Beyond this we did not observe much new in the habits of the Grebes, as we only saw six or eight and these were very shy and would not allow a close approach like the Gallinules. We found, however, another Grebe's nest containing six eggs about a week old. It was close by the nest you found on June 17, and was perhaps a second attempt of the same pair of birds. We made careful measurements of the nest, as follows: Eighteen inches in diameter at the water line; nest cavity four and one half inches in diameter and one and one half inches deep; top of the nest two and one half inches above

the water (not including the covering of the eggs, which would make it another one half inch); nest about eight inches deep from water line to bottom of structure; attached to cat-tails in three places; at two of these places there were two stalks of cat-tails and only a single one at the third; the double stalks were on opposite sides of the nest, and the single one between these on the inside arc; these stalks were all about an inch in from the edge of the nest; you could pass your hand entirely under the nest except where the stems of the cat-tails came through, so it was thus truly a floating structure merely anchored to the cat-tails, composed of decaying vegetation and almost entirely of cat-tails."

In reference to the food of the Gallinules, it might be added that they are not, as I at first supposed, dependent upon the presence of duckweed, as Dr. Merriam found the birds nesting in a marsh near Chicago, where there was no duckweed at all.

To sum up, five separate visits were made to the marsh during the summer of 1906, comprising four full days and two afternoons. Evidences were found of the following species nesting there: Pied-billed Grebe, American Bittern, Least Bittern, Virginia Rail (?), Florida Gallinule, American Coot, Red-winged Blackbird, Swamp Sparrow, and Long-billed Marsh Wren. Of these birds, the most interesting of course are the Grebe, the Gallinule, and the Coot. In 'American Museum Guide Leaflet, No. 22' (July, 1906) — the latest publication on the birds of the vicinity of New York City, — Mr. Frank M. Chapman says of the Pied-billed Grebe: "Occurs chiefly as a migrant. I know of no definite instance of its breeding"; of the Florida Gallinule: "Its nest has not been found in the immediate vicinity of New York City, where it is known only as a rare migrant"; and of the American Coot: "Recorded as breeding only near Morristown, N. J." Although we failed actually to find the nest of the Coot, we discovered five occupied nests of the Grebes, and seventeen occupied nests of the Gallinules. This latter figure does not, however, give an adequate idea of the numbers of the Gallinules, for at least fifty empty nests were found, all of which must have been constructed this year, as we were informed by some boys that the marsh is burned over each winter for use as a skating pond.

NOTES ON THE SPRING BIRDS OF TISHOMINGO
COUNTY, MISSISSIPPI.

BY ANDREW ALLISON.

IN THE spring of 1904, a month's investigation of ornithological and botanical conditions in the valley of the Tennessee River, where it borders Mississippi, furnished me with some interesting material, upon which I base the remarks that follow.

Tishomingo County occupies the northeastern corner of Mississippi, adjoining Tennessee on the north, and Alabama on the east; the Tennessee River runs northwestward across the northeast corner, constituting the State line, and relieving the otherwise rectilinear character of the county boundaries. The valley of this river is very narrow on the Mississippi side, and the interrupted chain of hills rises again within a few hundred yards of the abrupt bank. These hills are the foot-hills of the Alleghanies; entering the State at this point, they extend southwestward, reaching their maximum elevation of 800 feet in Pontotoc County, and terminating in the extreme southwest, in Wilkinson County.¹

This county is a part of the Yellow Loam Region, which includes about one third of the State;² but, except in the narrow flood-plain of the Tennessee River, and the broader ones of certain important creeks, the soil layer is thin, and easily exhausted. Much gravel is present, and renders much of the land practically unfit for agriculture. The deep soil of the creek and river bottoms is a brown alluvial, of excellent fertility; and the natural growth of these bottoms, subject to frequent inundation, is rich and varied. But the points of geological interest are to be gathered from the hills; and turning to these again, we find them similar to those of northern Alabama, in that they are in large part underlaid by limestones of the drift formation. This limestone bed is so thick that in many cases the hills may be said to be made of it. In my notes I find this record:

¹ J. R. Preston, *Frye's Geography*, Mississippi Edition.

² For some of these remarks on the geology of the region I am indebted to Dr. Hilgard's report on the 'Geology and Agriculture of Mississippi.'

"In a hillside rising immediately beyond a most precipitous descent, is the main opening to a 'silica' mine [so called by the natives] which was abandoned because of the fatality among laborers working up the material — though the miners themselves were not affected. The walls of the cave are of an amorphous, softish, chalky material, now damp and covered in many places with slime and moss. The whole hill appears to be of this material, and so do many of the others near by. The main tunnel is about a hundred yards long."

In many places on the hills this limestone is present in the form of irregular pieces of blue stone about as large as a turkey's egg. A talus of this sort at the foot of the viciously steep little hills makes climbing very difficult; and often the same rock is encountered all over the hill. In large, flat pieces, often ten or twelve feet square, it forms terraced ledges through and over which the little streams run; and altogether it is the characteristic rock of the region directly bordering the Tennessee valley, where I spent the whole of the month at my disposal.

Though cropping out, as I have said, in many places, elsewhere this blue limestone underlies red sandstone; this I found to be the case near the town of Iuka. And between this point and my destination on the river, I crossed thick, level beds of the yellow loam, wooded with old-field and short-leaf pine (*Pinus taeda et echinatus*), and underlaid with a loose red sand — under which in turn was doubtless the limestone again.

In its flora and fauna this county presents characters of a rather transitional nature; a few examples will serve to show the mingling of species belonging to the Upper and the Lower Austral life-zones respectively — as these have been characterized by Dr. Merriam, — a decided predominance of Carolinian forms being evident.

Of mammals, I found most common the cotton-tail rabbit (*Lepus floridanus mallurus*); the white-footed mouse (*Peromyscus leucopus*); the chipmunk (*Tamias striatus*); the southern gray squirrel (*Sciurus carolinensis*); and the red bat (*Lasiurus borealis*). It will be seen that none of these are species confined to the Austro-riparian zone. The *Peromyscus* is not generally regarded as a southern species at all, and the chipmunk is placed by Dr. Merriam among the mammals of the Transition zone.

Other species were the water hare (*Lepus aquaticus*) and the opossum (*Didelphis virginiana*); of raccoons I could not be sure; but I found pawpaw seeds on logs by the creeks, which must have been left there by either these animals or opossums.

Reptiles were very uncommon, with the exception of two lizards, and all but one were species of rather general distribution. The two lizards referred to are *Sceloporus undulatus* and *Cnemidophorus sex-lineatus*; the Austroriparian *Anolis principalis* I saw rarely — once, oddly enough, on a spray of trailing arbutus! The only snakes I saw were the black form of *Bascanium constrictor*, and one individual of the “spreading adder” (*Heterodon platyrhinus*).

Breeding birds, absent in that capacity from most parts of the State, were: Catbird, Phoebe, Prairie Warbler, and Whip-poor-will; as I shall mention again below, I have hypothetically placed on the breeding list Goldfinch and Robin. But with all these mingle such distinctively southern species as Chuck-will’s-widow, Red-cockaded Woodpecker, and Mockingbird. Fuller remarks on these species will follow. Certain birds were noticeably absent — perhaps the most important being Loggerhead Shrike, American Sparrow Hawk, and Red-shouldered Hawk; but their absence was evidently due to local ecological conditions, and is of course of no importance in assigning this county to its place in the life-zones.

It remains now to sketch the flora. The low hills are thickly wooded, though large trees are the exception except in the valleys: old-field and short-leaf pine (*Pinus taeda et echinatus*), hickory (*Hicoria tomentosa*), dog-wood (*Cornus florida*), and numerous species of oaks compose the tree growth; while beneath them flourishes an undergrowth of Ericaceous shrubs.

The oaks are: black-jack (*Quercus marilandica*), post oak (*Q. minor*), scarlet oak (*Q. coccinea*), Spanish oak (*Q. digitata*), and chestnut oak (*Q. prinus*); and the principal species of huckleberry are: *Vaccinium stamineum* (a form with large leaves), *V. corymbosum*, *V. arboreum*, and a small species that seems most like *V. vacillans*. A tree commonly present, but fruiting little, and apparently of vanishing importance, as Dr. Mohr observes of it in Alabama, is the chestnut (*Castanea dentata*). On high summits another pine sometimes relieves the monotony of the common

short-leaf; this is *Pinus inops*. Somewhat local are the beautiful mountain laurel (*Kalmia latifolia*) and trailing arbutus (*Epigæa repens*).

Saxifrages are characteristic herbs of the rocky hills: they are *Saxifraga virginensis* and *Heuchera americana*. Other herbs are: early buttercup (*Ranunculus fascicularis*), white larkspur (*Delphinium virescens*), *Alsine pubera*, Indian pink (*Silene virginica*), bird-foot violet (*Viola pedata*), purple wood-sorrel (*Oxalis violacea*), *Houstonia purpurea*, "everlasting" (*Antennaria plantaginifolia*), and phlox (*Phlox reptans et amœna*).

The lesser valleys between the hills are fringed with the many-tinted "bush honeysuckle" (*Azalea nudiflora*), under which the bare damp earth is flecked with bluets (*Houstonia cœrulea*). Heavy shade, haunted of Wood Thrushes and Acadian Flycatchers, is cast by red maples (*Acer rubrum*) and white oaks (*Quercus alba*). In open places is found the snowberry or coral-berry (*Symphoricarpos symphoricarpos*). Here and there the hills are bordered by swamps; and here black gum (*Nyssa multiflora*); alder (*Alnus rugosa*) and 'bamboo' (*Smilax* spp.) grow, with ferns and white violets flourishing between. The only fern requiring special notice is a maiden-hair (*Adiantum pedatum*), growing on damp hillsides above the swamps.

By the brooksides grow crab-apple (*Pyrus angustifolia*) and red maple; over these clamber honeysuckle (*Lonicera sempervirens*), the naturalized Japanese honeysuckle (*L. japonica*), and bamboo (*Smilax rotundifolia*). Beneath grow spring beauty (*Claytonia virginica*) and anemone (*Syndesmon thalictroides*) in the shade, and cinquefoil (*Potentilla canadensis*) in the sun. Or, in lower places, thickets of alder and thin groves of small willows (*Salix nigra*) may form the stream-fringe.

The old fields in the narrow levels between brooks and hills grow the fragrant pink rose (*Rosa rubiginosa*); the feeble, trailing black-berry (*Rubus enslenii*); and of herbs, speedwell (*Veronica peregrina et arvensis*), 'johnny jump-up' (*Viola tricolor arvensis*), the little skull-cap (*Scutellaria parvula*), mouse-tail (*Myosurus minimus*); and a little evening primrose of some importance, because not reported heretofore, I think, from either Alabama or Mississippi — *Ænothera linifolia*. Thickets in these fields, as everywhere,

are tangles of blackberry (*Rubus argutus*) and sumac (*Rhus copallina*).

Or, in fields long abandoned, we may find scrubby pines (*Pinus taeda*), among rank 'broom-sedge' (*Andropogon virginicus*) that crowds out almost all other plants; though it gives place, here and there, to patches of wild plum (*Prunus chicasa*).

The low woods of the creek and river bottoms contain birch (*Betula nigra*), water oak (*Quercus nigra*), basket oak (*Q. michauxii*), sycamore (*Platanus occidentalis*),—present also along upland brooks—maple (*Acer dasycarpum*), sweet-gum (*Liquidambar styraciflua*), and cypress (*Taxodium distichum*). In higher ground in the valley are locust (*Robinia pseudacacia*), hackberry (*Celtis mississippiensis*), and sassafras (*Sassafras sassafras*). Common climbers on the border of these woods are trumpet creeper (*Tecoma radicans*) and cross-vine (*Bignonia capreolata*). And on the ground rising from the river I found wild strawberry (*Fragaria virginica*).

Roadside plants are haws (*Crataegus spathulata et mohrii*), moth mullein (*Verbascum blattaria*), and dandelion (*Adopogon dandelion*).

More enumeration would carry me beyond the limits set by the title of this article, which perhaps I have already exceeded; and without further preface I offer the detailed account of the birds observed from April 17 to May 17. The town of Iuka, several times to be mentioned, is about six miles southwest of the farmhouse which I made my headquarters, and is consequently out of the valley of the Tennessee River.

1. **Ardea herodias.** GREAT BLUE HERON.—One seen April 24, flying westward.

2. **Butorides virescens.** GREEN HERON.—Seen occasionally after April 21, at creeks and ponds.

3. **Fulica americana.** AMERICAN COOT.—I saw one swimming in a marshy mill-pond near Iuka, on April 30. The bird may have been a cripple; but if not, it was doubtless one of a breeding pair; for the next time I passed the spot, on May 17, it was still there.

4. **Actitis macularia.** SPOTTED SANDPIPER.—Sparingly present along the larger streams, and at the pond where I saw the Coot.

5. **Colinus virginianus.** BOB-WHITE.—A common bird in the open. It seems to nest quite late; for I flushed several pairs from their task of

constructing their domed nests under tussocks of *Andropogon*, after May 10, and found eggs but once.

I heard rather often a cry that I likened to the wild call of the Pileated Woodpecker; as the birds were flushed, they would dart off with this outburst of peculiarly wild sound; and the effect was startling. I think only the male uttered it; and at times I heard birds apparently answering each other, perhaps in challenge.

6. **Zenaidura macroura.** MOURNING DOVE.—Fairly common, and singing.

7. **Cathartes aura.** TURKEY VULTURE.—Common, not abundant.

8. **Catharista urubu.** BLACK VULTURE.—Much less common than the preceding.

9. **Elanoides forficatus.** SWALLOW-TAILED KITE.—One was seen May 12, flying northward, and accurately described to me.

10. **Accipiter velox.** SHARP-SHINNED HAWK.—Occasional after May 2.

11. **Accipiter cooperi.** COOPER'S HAWK.—Not abundant, but quite regular. On April 19 I found a nest, concerning which the female showed much solicitude. She sailed about, uttering a dry, monotonous rattle, but left when I climbed to the nest. It was about thirty-five feet up in a post-oak. A similar nest, out of repair, was in a tree close by, having doubtless formerly served the same birds.

The occupied nest had a heavy foundation of twigs, overlaid with rootlets; but it was lined with scales of pine bark, on which lay three short oval eggs, quite fresh, but slightly nest-stained.

12. **Buteo borealis.** RED-TAILED HAWK.—I think a pair bred on the hills back of the house in which I stayed; these were the only ones I saw.

13. **Buteo platypterus.** BROAD-WINGED HAWK.—The commonest of the hawks; I found no nests, but saw and heard the birds often.

14. **Haliaeetus leucocephalus.** BALD EAGLE.—A pair flew over, screaming, late in the evening of April 29.

15. **Syrnium varium.** BARRED OWL.—Rare.

16. **Megascops asio.** SCREECH OWL.—Heard one May 10.

17. **Coccyzus americanus.** YELLOW-BILLED CUCKOO.—This bird apparently did not arrive until April 28; after that date one or two were seen daily, until the bulk arrived May 3.

The habit of nocturnal song was very noticeable; I find these entries in my note-book: "May 1 . . . At night I heard the full song of a Yellow-billed Cuckoo, delivered, I thought, while the bird was in flight." "May 8 . . . Almost every night I hear the notes of Yellow-billed Cuckoos; I can rarely be sure whether or not they are flying; usually they are at rest, I think."

18. **Ceryle alcyon.** BELTED KINGFISHER.—Not common.

19. **Dryobates villosus audubonii.** SOUTHERN HAIRY WOODPECKER.—Common.

20. **Dryobates pubescens.** DOWNY WOODPECKER.—Common.
 21. **Dryobates borealis.** RED-CKADED WOODPECKER.—Fairly common; very noisy, and not likely to be overlooked when present.
 22. **Ceophlœus pileatus.** PILEATED WOODPECKER.—Common, and not especially shy; nor does it confine itself to the deeper forests.
 23. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.—Not common; it prefers large dead trees in clearings, and these are hardly to be had in this region. The same explanation can probably be offered in the case of the absent Sparrow Hawk.
 24. **Centurus carolinus.** RED-BELLIED WOODPECKER.—Not uncommon; mainly confined to the creek woods. I noticed that it utters many of the notes of the preceding species; it is an undoubted fact that there is much local variation in the notes of this bird.
 25. **Colaptes auratus.** FLICKER.—Common.
 26. **Antrostomus carolinensis.** CHUCK-WILL'S-WIDOW.—Common; but less so than the succeeding species, and arriving later. I heard Whip-poor-wills from the night of my arrival in the valley, April 18, but the voice of this more southern bird was not added to the caprimulgine chorus until April 22. It was common after April 28.
 27. **Antrostomus vociferus.** WHIP-POOR-WILL.—Very common. The song generally commenced about seven o'clock, on clear nights; and once I heard a Whip-poor-will cry at five in the morning. I heard none at all in bad weather.
 28. **Chordeiles virginianus.** NIGHTHAWK.—Fairly common. None were seen until April 24, and I never noted the species as really common.
 29. **Chætura pelagica.** CHIMMEY SWIFT.—Common, and of normal habits. I found a nest in the chimney of a deserted cabin in the heart of the hills; and they nested also in the occupied farm-houses.
 30. **Trochilus colubris.** RUBY-THROATED HUMMINGBIRD.—Common; the bulk arrived April 22.
 31. **Tyrannus tyrannus.** KINGBIRD.—Fairly common; it did not arrive in breeding numbers until about May 1, and never became abundant.
 32. **Myiarchus crinitus.** CRESTED FLYCATCHER.—Common from the time of my arrival
 33. **Sayornis phœbe.** PHŒBE.—I thought I heard one of these birds on April 18, and later on I discovered it to be a rare breeder. In the tunnel I have before referred to, cut in the rotten limestone of a steep hillside, I found a nest perched on a narrow ledge about six feet up. It was composed externally of green moss, and contained four young a few days old; they were silent, unemotional little creatures, and made no demonstration when I took the nest down to see them more closely, or when I replaced it.
- The mother waited outside the tunnel, calling frequently. It struck me as singularly appropriate that the first rocky cave I had entered in Mississippi should hold a Phœbe's nest; for in less typical situations we have never noted the bird except as a winter resident.

This was on April 27; the next day I found an old nest — probably of the same pair, since I saw no others — in an abandoned cabin near the cave.

34. **Contopus virens.** WOOD PEWEE.— Common.

35. **Empidonax flaviventris.** YELLOW-BELLIED FLYCATCHER.—I took one May 9, from a flock of migrant warblers.

36. **Empidonax virescens.** GREEN-CRESTED FLYCATCHER.— Common; I noticed it first April 23, and found it common about May 3.

[**Empidonax traillii.** TRAILL'S FLYCATCHER.—On April 26, and on one or two other dates, I thought I saw this flycatcher; but each time I failed of positive identification.]

37. **Empidonax minimus.** LEAST FLYCATCHER.—I took one May 10. It was quite silent, but active, making short excursions from a sparse thicket of sumac and blackberry, and always perching in a scrupulously erect position.

38. **Cyanocitta cristata.** BLUE JAY.—Fairly common; but the small oaks of the hills tempt it less than the larger trees about the town. I found it common in Iuka.

39. **Corvus brachyrhynchos.** AMERICAN CROW.— Common.

40. **Dolichonyx oryzivorus.** BOBOLINK.—This bird I observed three times; on April 30 I saw a flock of about twenty males in an open pasture near Iuka; the next day another flock was reported from a point near the river; and a single female flew over on May 6.

41. **Agelaius phoeniceus.** RED-WINGED BLACKBIRD.—A very local breeder in low fields and marshy ponds, of which situations there are not sufficient to make the bird abundant.

42. **Sturnella magna argutula.** SOUTHERN MEADOWLARK.— Not at all common.

43. **Icterus spurius.** ORCHARD ORIOLE.— A fairly common breeder. I saw several at Grand Junction, Tennessee,—about a hundred miles northwest of Iuka,—on April 16; but the species did not reach this valley until April 23, becoming common about the same time.

44. **Icterus galbula.** BALTIMORE ORIOLE.—I saw this bird also at Grand Junction on April 16, but saw none here until April 24, and none after April 29. It seems unwise to base conclusions on a month's record, but the natural deduction would be, that this valley is a sort of pocket and receives by degrees the overflow from the Mississippi Valley migration stream; though it will be seen from the notes to follow, on the warblers, that this region lies — for some species at least — in a line of migration not originating in the Mississippi Delta. The same theory will not apply to all the species mentioned here, but I offer the above as an explanation of an apparently paradoxical situation.

45. **Quiscalus quiscula æneus** BRONZED GRACKLE.— Breeds commonly in a low wooded park in Iuka; but I saw it only once near the river, on April 28.

46. **Carpodacus purpureus.** PURPLE FINCH.—I saw many females

in the above-mentioned park, on April 17; and the next day I thought I saw several among pine-trees on the hills near the river.

47. *Astragalinus tristis*. AMERICAN GOLDFINCH.—Probably resident. I found much migrational activity when I arrived—April 17—and the finches continued to flock and sing until April 27; after that date I saw them passing over in pairs, and find them recorded as “constantly passing over” as late as May 6; and I took one of a mated pair on May 7. I found no nests; but I left with a very distinct impression that Goldfinches breed in the Tennessee Valley in Mississippi.

48. *Passer domesticus*. ENGLISH SPARROW.—Present about the farm-houses near the river, and common in Iuka.

49. *Poecetes gramineus*. VESPER SPARROW.—Saw one in a meadow near Iuka, April 17.

50. *Chondestes grammacus*. LARK SPARROW.—A very handsome individual was feeding with a group of Chipping Sparrows in the Iuka park, on April 17. Of late we have found it not very uncommon in winter on the Gulf coast of Mississippi, but this is our only interior record, though Mr. H. H. Kopman has reported it from Madison Parish, Louisiana, directly across the Mississippi River from Vicksburg.

51. *Zonotrichia albicollis*. WHITE-THROATED SPARROW.—Very abundant in thickets and hedge-rows. I heard them singing as soon as I arrived at my destination, and frequently I found the hillsides covered with the creeping, rustling little creatures, and the thickets bordering the hills deserted; but they withdrew to cover again immediately on any alarm. The bulk left about May 4, and I saw the last May 9.

Once I heard a rather peculiar song that led me to suspect the presence of *Z. leucophrys*; but I soon traced it to its source as an individual peculiarity.

52. *Spizella socialis*. CHIPPING SPARROW.—Abundant everywhere, except in the extremely open country occupied by the following species.

53. *Spizella pusilla*. FIELD SPARROW.—Common in the old fields grown up with *Andropogon*. One of the several nests I found was placed in a tussock of this grass; it was situated among the culms much as the nest of a Red-wing is placed among reeds. It contained four eggs on May 12.

54. *Peucæa æstivalis bachmanii*. BACHMAN'S SPARROW.—Of local distribution, but not uncommon. This is a most interesting bird, and varies much in its habits in different regions; even in the same locality there may be two quite dissimilar songs, as I noticed here,—one quite like that of the Field Sparrow, one like that of the Chipping. The birds of this county are larger and grayer than those of the Gulf coast,—less typical of the subspecies; and they prefer the open country to the pine barrens. I have these notes of their behavior: “I found Bachman's Sparrows again on the border of the pine thicket; they behaved somewhat like Swamp Sparrows in the brush, though on the ground they ran rapidly, flushing from it with the explosive spring of *Coturniculus* or *Passerculus*. One wandered into the thick sedge-grass (*Andropogon*).”

55. *Melospiza lincolni*. LINCOLN'S SPARROW.—This is another very interesting species. We have never been able to detect it in any other part of the State, and I watched its movements closely after I found it here April 23.

It proved to be not uncommon, and lingered until May 15. Generally I found them singly, creeping about in some thicket or hedge-row; but sometimes they crept about fences in a rather wren-like way; and one deepened this impression by concealing itself in a pile of cross-ties by the roadside. After May 10 I watched one whose quarters were in a brush-pile by a brook; it often sang, gliding about like a House Wren, a fine liquid warble much like that of this wren, but of sweeter, lower tone, and much longer duration.

56. *Melospiza georgiana*. SWAMP SPARROW.—I saw none before April 25; it was fairly common April 27, increased May 3, decreased again May 4, and was last seen May 6.

57. *Pipilo erythrophthalmus*. TOWHEE.—Common, and showing no evidence of migratory habits.

58. *Cardinalis cardinalis*. CARDINAL.—Common; and singing finely and constantly.

59. *Zamelodia ludoviciana*. ROSE-BREASTED GROSBEAK.—I saw a very handsome male on May 2, with a flock of Bay-breasted Warblers; it uttered a peculiar and indescribable note.

60. *Cyanospiza cyanea*. INDIGO BUNTING.—This species became very abundant April 24 — the first I saw of it. These were mostly males. I heard one sing at night on April 30. It was present mainly in the capacity of a migrant until about May 3, when its numbers decreased; another wave passed through May 9; by May 14 all but breeders were gone, I think, and I found a nest with two eggs on May 15. The birds were very shy, and I saw the brooding mother only after several stealthy approaches.

61. *Piranga erythromelas*. SCARLET TANAGER.—First seen in Iuka April 17; the next appeared April 22, after which I found them fairly regular until the last left on May 12. Nearly all were males, but I heard the song only once.

62. *Piranga rubra*. SUMMER TANAGER.—This bird appeared April 19, and was common after April 25.

63. *Progne subis*. PURPLE MARTIN.—Common in Iuka when I arrived. But evidently migration was not over; for on April 21 a flock of about fifteen martins suddenly appeared, silent as spirits, and alighted in a huddled group on a dead tree near me. On May 3 and 5 a pair prospected without success, probably seeking a site for a second nest, in a sparrow-haunted martin-box near the house where I stayed.

64. *Hirundo erythrogastra*. BARN SWALLOW.—Present from the time of my arrival until May 11; but never common, and rarely singing.

65. *Iridoprocne bicolor*. TREE SWALLOW.—I saw some with Rough-winged and Barn Swallows flying over a meadow near Iuka, April 17.

66. *Stelgidopteryx serripennis*. ROUGH-WINGED SWALLOW.—I found

no nests, but the species was evidently breeding in the limestone banks of the brooks near the river, as well as in suitable places near Iuka. I thought often that Bank Swallows must be mingled with the Rough-wings, but careful search revealed none. One individual I saw was characterized by a white tail-feather.

67. *Ampelis cedrorum*. CEDAR WAXWING.—A small flock appeared May 6, and some may have remained to breed; but I heard them last on May 16; and, since even at New Orleans they may be seen all through May, no special significance attaches to their presence here at such a date.

68. *Vireo olivaceus*. RED-EYED VIREO.—The commonest breeder of the region; present continuously, and abundant from April 22.

[*Vireo philadelphicus*. PHILADELPHIA VIREO.—I saw one at Grand Junction, Tennessee, on April 16; it was on the border of an oak grove wherein were other migrants.]

69. *Vireo flavifrons*. YELLOW-THROATED VIREO.—Not common as a breeder, but quite so as a migrant up to the last week of April. The song is distinguishable from that of the Red-eye by its greater depth, richness, and deliberation.

70. *Vireo noveboracensis*. WHITE-EYED VIREO.—A very common breeder.

71. *Mniotilta varia*. BLACK-AND-WHITE WARBLER.—Present from the first, and abundant nearly throughout my stay, though fluctuating in numbers. I found it fairly common on May 20 in Amite County, nearly four degrees further south; and I therefore cannot assign May 14—the day I last saw it in Tishomingo County—as the end of its spring sojourn. It certainly breeds.

The great versatility of this warbler in vocal effects was well illustrated during this time; I know of no other warbler except the Chat that can produce so great a variety of sounds; and since nearly all of the notes resemble those of other warblers, this is a most confusing bird to deal with during the busy season of “waves.”

72. *Helmitherus vermivorus*. WORM-EATING WARBLER.—Present from the first, and common until quite late; it ceased to be apparent during the latter part of my stay, but I found it with *Mniotilta* in Amite County.

73. *Helminthophila pinus*. BLUE-WINGED WARBLER.—I first observed it April 18; it became common April 21, and thereafter fluctuated until May 8, after which it remained common in the open regions bordering woods. Its monotonous song, generally uttered at short intervals from near the top of a tree, while the singer sat motionless, was a familiar sound.

74. *Compsothlypis americana ramalinæ*. WESTERN PARULA WARBLER.—Several very diverse specimens of this species were all referred by Mr. Oberholser to this subspecies. It was never common, and as a breeder it seems rare.

75. *Dendroica tigrina*. CAPE MAY WARBLER.—I took a male from a flock of migrant warblers on May 4. This is the first record for Mississippi,

and there is but one for Louisiana—also a spring record, from New Orleans. Evidently this species is one of those not entering the Mississippi Valley route by way of the delta.

76. *Dendroica æstiva*. YELLOW WARBLER.—Sparingly present from April 17 to May 1.

77. *Dendroica cærulescens*. BLACK-THROATED BLUE WARBLER.—I saw a male on April 29, with other migrant warblers. This is another bird new to the State list, and almost unknown in Louisiana.

78. *Dendroica coronata*. MYRTLE WARBLER.—Very common, in bright, though incomplete, plumage, and fine song, up to April 26; after this less common until it left on May 5.

79. *Dendroica maculosa*. MAGNOLIA WARBLER.—A late migrant, as it is everywhere in the State. I saw it first on May 3, and it was present rather commonly until May 16.

80. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.—I took a male on May 9; it was in fine song—a long warble like that of House Wren.

81. *Dendroica castanea*. BAY-BREASTED WARBLER.—Very common from time to time, but always in close flocks. It mingled freely with other species, but it was very noticeable that the two sexes of this species were rarely to be seen in the same group. I also found that it showed rather a fondness for pine trees, when these occurred among the oaks, which was not shared by any of the other migrant warblers. I saw the first April 29, and the last May 9.

82. *Dendroica striata*. BLACK-POLL WARBLER.—Common in varying degrees from April 26 to May 3; these were almost all females. After this came a period of rarity, and the last—one of the few males seen was taken on May 12. This one was singing a feeble cricket-like song, and after long search I discovered it actively exploring the branches of a Spanish oak on the border of a field.

83. *Dendroica blackburniæ*. BLACKBURNIAN WARBLER.—Rather common from April 27 to May 5. Males predominated, and sometimes sang their weak imitation of Indigo Bunting's song.

84. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.—Present from April 23 to May 10; generally common, though flocking less than some of the other species; and well distributed. I noticed two distinct songs, neither strikingly original: one, a rather featureless trill, I have described in my notes as "Paruloid"; the other smacked strongly of the Chickadee's notes.

85. *Dendroica vigorsii*. PINE WARBLER.—Abundant, and very noisy.

86. *Dendroica palmarum*. PALM WARBLER.—It seems singular that this form of Palm Warbler should occur here, in place of *D. p. hypochrysa*, our common Mississippi coast form; but this was the case, and on one day it was very abundant. I first noticed it April 19—though it doubtless winters—and on April 22 it was abundant with other warblers in *Vaccinium* undergrowth on the hillsides; after this it was not abundant, but lingered until May 6.

87. *Dendroica discolor*. PRAIRIE WARBLER.—A common breeder in the cleared regions that have grown up in thickets; and an abundant migrant, its wiry trill being sometimes one of the conspicuous bird voices of the hillsides. I first heard it April 19; found it abundant with Palm Warbler April 22; after April 23 the residents scattered, and the great majority left the woods for the fields.

88. *Seiurus aurocapillus*. OVENBIRD.—I was sure of seeing this usually common bird only once; I took one May 4.

89. *Seiurus motacilla*. LOUISIANA WATER-THRUSH.—A breeder along the brooks and creeks, but not common. I first heard it April 19, uttering its clear, far-reaching song by the side of a rocky brook.

90. *Geothlypis formosa*. KENTUCKY WARBLER.—Present at the time of my arrival; less common later, the surplus probably passing to wider bottom-lands as was doubtless the case also with Black-and-white, Worm-eating, Western Parula, Hooded Warblers, and Redstart.

91. *Geothlypis trichas brachidactyla*. NORTHERN YELLOW-THROAT.—The Yellowthroats I collected on this expedition are now in the hands of Mr. F. M. Chapman, and have not yet been passed upon; but I refer them provisionally to this subspecies. It is common in suitable localities.

92. *Icteria virens*. YELLOW-BREASTED CHAT.—Very common in alder and blackberry thickets. First noted April 23, when it was tolerably common; the bulk arrived about May 1. I found nests with eggs on May 10 and 16.

93. *Wilsonia mitrata*. HOODED WARBLER.—Common when I arrived, and present through my stay; but of course absent from the hills after about May 1.

94. *Wilsonia canadensis*. CANADIAN WARBLER.—First seen May 3, last seen May 11. Tolerably common, but always single; it was very active, and often sang a pleasing little lay possessing well-marked generic characters.

95. *Setophaga ruticilla*. AMERICAN REDSTART.—I saw a female on April 24, and noted the last of the hill migrants soon after this. Doubtless I could have found breeders in the swamps later than this. It was at no time common.

96. *Mimus polyglottos*. MOCKINGBIRD.—Not very common. I found a nest containing three eggs on May 10, and by May 14 the young were hatched.

97. *Galeoscoptes carolinensis*. CATBIRD.—A very common breeder, and a very abundant migrant. On April 24 Catbirds were everywhere; but they soon settled down to breeding numbers; and on May 14 and 16 I found nests with full sets of eggs.

98. *Toxostoma rufum*. BROWN THRASHER.—Doubtless a constant resident; its numbers underwent no fluctuation while I remained, and it was always a familiar bird of the thickets. I found a nest with eggs on April 25; these did not hatch until about May 9. On May 15 I found another nest with two eggs.

99. *Thryothorus ludovicianus*. CAROLINA WREN.—A common resident.

100. *Thryomanes bewickii*. BEWICK'S WREN.—Not common; but evidently it breeds about the farm-houses, and also in Iuka; and I saw a pair at Grand Junction, Tennessee, on May 17. Though less exuberant than the foregoing, this wren seems to be always in song.

101. *Troglodytes ædon*. HOUSE WREN.—Not common; I saw the last April 27.

102. *Sitta carolinensis*. WHITE-BREASTED NUTHATCH.—Not very common.

103. *Sitta canadensis*. RED-BREASTED NUTHATCH.—I saw one of these birds at Grand Junction, Tennessee, on April 16, in an oak grove with other migrants; and on April 28 I saw a pair on a high hill near the river. The male was sitting quite motionless at first, uttering a wild, querulous, long-drawn cry, which seemed to be a call for the female; for the latter soon appeared, and the male then resumed his wonted voice and activity.

104. *Sitta pusilla*. BROWN-HEADED NUTHATCH.—Common.

105. *Bæolophus bicolor*. TUFTED TITMOUSE.—Very common.

106. *Parus carolinensis*. CAROLINA CHICKADEE.—Less common than the preceding.

107. *Regulus calendula*. RUBY-CROWNED KINGLET.—Present, in less than winter numbers, and singing, until May 1.

108. *Polioptila cærulea*. BLUE-GRAY GNATCATCHER.—Already common when I arrived.

109. *Hylocichla mustelina*. WOOD THRUSH.—One of the commonest breeders; I found the nests of past seasons in every little hollow, though I failed to locate any occupied. It was present when I arrived, and I saw it also at Grand Junction, Tennessee, on April 16.

110. *Hylocichla fuscescens*. WILSON'S THRUSH.—Not common; first seen April 20, last seen May 3.

111. *Hylocichla ustulata swainsonii*. OLIVE-BACKED THRUSH.—Sparingly present from May 2 to May 16.

112. *Hylocichla aliciae*. GRAY-CHEEKED THRUSH.—Quite uncommon; first seen April 22, last seen May 5.

113. *Hylocichla guttata pallasii*. HERMIT THRUSH.—Decreased gradually from fair numbers, until the last left on April 26.

114. *Merula migratoria*. AMERICAN ROBIN.—This bird probably breeds in the wooded park at Iuka; I had no opportunity to go there when I passed through the town on May 17; but I had seen there, on April 30, birds that I supposed to be breeding. The last near the river passed through May 3; there were three. I took a female, and found her very fat, but in poor plumage.

115. *Sialia sialis*. BLUEBIRD.—Common. Parent birds were leading about fledged and flying young on May 13; but a nest found May 11, in a hollow fence-post, contained five eggs.

THE RIO GRANDE SEEDEATER, ITS STATUS AND
TECHNICAL HISTORY.

In 1851, Mr. George N. Lawrence (Ann. N. Y. Lyc. Nat. Hist., V, 1852, p. 123) described what was evidently a male specimen of the Rio Grande Seedeater, "procured in [Brownsville] Texas by Capt. J. P. McCown, U. S. A.,"¹ but instead of giving it a new name referred it to *Spermophila albigularis* Spix, from the province of Bahia, Brazil. Four years later Dr. P. L. Sclater (P. Z. S., 1856, p. 302) provisionally referred Mr. Lawrence's *S. albigularis* to *S. moreletii* Bonap., based on specimens from Guatemala. This determination appears to have passed unchallenged till 1888, when Dr. R. B. Sharpe (Cat. Bds. Brit. Mus., XII, 1888, p. 124) identified the Rio Grande bird as *S. parva* Lawr., and gave the range of *S. moreletii* as from "Yucatan to Guatemala, Honduras, and Costa Rica," referring *moreletii* of authors, from Mexico and Texas, to Lawrence's *parva*.

In the meantime Mr. Lawrence had not felt convinced that Sclater's decision was correct, and in 1889 (Auk, VI, Jan. 1889, pp. 53, 54) summarized the history of the case, pointing out the differences separating the Rio Grande bird from both *S. parva* and *S. moreletii*, and naming the Rio Grande bird in honor of Dr. Sharpe, "as he is," said Mr. Lawrence (*l. c.*, p. 54) "the only one who has recognized it as being distinct from *S. moreletii* Bp." Mr. Lawrence called it *Sporophila moreletii sharpei*, and under this designation the Rio Grande bird was entered in the second edition of the A. O. U. Check-List. It was correctly recognized under this name until its status was again challenged by Mr. Ridgway, who, in his 'Birds of North and Middle America' (Part I, 1901, p. 575), considered it indistinguishable from *Sporophila moreletii*. In commenting on the case (*l. c.*, footnote) he says:

¹ This interesting specimen, a male, is No. 41296, in the collection of the American Museum of Natural History, from the Lawrence Collection. On the original label is inscribed in Mr. Lawrence's handwriting, "Spermophila, believed to be a new species." Mr. Lawrence's label, written some time later, has "Spermophila moreletii Pucheran, juv. ♂, Texas," and, on the reverse side, "Brownsville, J. P. McCown."

"I find myself unable to subdivide this species satisfactorily. It is true specimens representing the fully adult male plumage described above are wanting in the series from the State of Tamaulipas and the adjacent parts of Texas: but males from that district agree exactly in plumage with immature males from more southern localities, and I believe that fully adult males have simply not yet been taken in the region designated."

On the basis of this "belief" *S. m. sharpei* was relegated to synonymy. The statement that "specimens representing the fully adult male plumage" of *S. morelleti* are wanting from the Rio Grande region is quite true, as is also the statement that males from this district "agree exactly [or nearly] in plumage with immature males from more southern localities." Although the "belief" based on these facts proves to have been unwarranted, the A. O. U. Committee, on the basis of the very inadequate material in the U. S. National Museum, gave this opinion its endorsement, and in the Twelfth Check-List Supplement (Auk, XX, July, 1903, p. 353) eliminated the subspecies *sharpei*.

Having had occasion recently to examine certain other Texas birds, the case of the Rio Grande *Sporophila* came also under notice, with the result that the fine series of these birds in the American Museum of Natural History (formerly in the Sennett Collection) furnishes indubitable evidence that the adult males of the Texas form do not acquire the broad black pectoral collar and the black back of typical *morelleti*, and that in consequence of their resemblance to immature males of true *morelleti* have been considered as also immature. Many scores of Texas specimens of *Sporophila* have found their way into collections, and it is surprising that the absence of males with a glossy black back and a broad black pectoral collar has not suggested the real solution of the case.

The American Museum of Natural History contains a series of 62 specimens of the *Sporophila morelleti* group. Of these 26—16 males and 10 females—are from Texas (8 from Brownsville, 17 from Lomita Ranch, 1 from Rio Grande City); 11 (10 males, 1 female) from Nuevo Leon (Montemorelos and Monterey); 6 males and 2 females from Tampico, Tamaulipas; 18 (14 males, 4 females) from southern Vera Cruz, Honduras, Yucatan, Guatemala, and Costa Rica. They are separable into three series: (1) Texas and

Nuevo Leon, (2) Tampico, (3) southern Vera Cruz and south to Costa Rica. The Texas series of 16 males presents three phases of plumage — 3 fully adult birds, 10 birds of the second year, and 3 yearling birds; of the 10 females all are adult except 2. Of the 10 breeding males and 1 female from Nuevo Leon, 9 of the males are in immature plumage, probably of the second year. Of the Tampico birds, 6 males and 2 females, 3 of the males and the 2 females are in mature plumage, the other 3 males in the transition plumage of the second year, although evidently breeding birds. These northern birds (37 are from the Rio Grande Valley), of whatever age or sex, are very different from birds of corresponding age and sex from southern Vera Cruz, Yucatan, Honduras, and more southern localities, the northern and southern forms being distinguishable as follows:

S. moreletii moreletii.

♂ ad. Sides and top of head, nape, back, wings and tail intense black; chin and throat, sides of neck, rump, and whole lower surface white, except a broad pectoral band of black; also a white speculum at base of primaries and tips of lesser and greater coverts white.

♂ juv. (second year). The areas black in the adult are irregularly mottled with deep black and olivaceous brown; below yellowish buff, with a patchy irregular pectoral band of black; rump olivaceous brown; wings and tail deep black.

S. moreletii sharpei.

♂ ad. Sides and top of head and nape dull brownish black; back brownish gray, more or less mottled with black, but generally the black of the dorsal surface is mainly concealed by the gray of the surface; wings and tail dull black; with white bars and speculum as in *moreletii*; chin, throat, sides of neck, rump, and whole ventral surface dull white, the breast mottled with black, mostly concealed, in place of the broad pectoral band in *moreletii*.

♂ juv. (second year). Head grayish brown mottled with black, or dull black with the feathers broadly edged gray or brownish gray; back gray brown, with or without more or less concealed or partly concealed blackish feathers; throat, sides of neck, and whole lower parts dull buffy white, with or without concealed mottling of black on the breast; wings and tail brownish black.

♂ juv. (first winter). Upper parts ochraceous brown, grayer on the head, more ochraceous on the lower back and rump, with usually a few specks of black on the head and pectoral region; below deep ochraceous; wings and tail ochraceous brown externally, the inner and basal portions of the quills brownish black; in other words, nearly like the female.

♂ juv. (first winter). Upper parts grayish brown, head clearer gray, lower back and rump dull buffy brown, with flecks of black on the head, mostly concealed or wanting; below pale buff; quills blackish, externally edged with grayish brown; in other words nearly like the female but grayer, with a tendency to concealed or partially concealed black on the head.

♀ ad. Above yellowish olive tinged with brown, below dull clay-color varying (in different birds) to raw sienna; distinct whitish wing bars.

♀ ad. Above uniform dull grayish olive; below pale buff; distinct whitish wing bars.

In other words, without regard to the less amount of black and its much duller tone in the northern birds, the general coloration at all stages and in both sexes is very different in the two forms. It is as strikingly pronounced in the females as in the males, the grayish olivaceous of the upperparts, and the pale buff of the lower parts, in the northern form (Texas and Nuevo Leon birds) being in strong contrast with the deep brownish yellow olive of the upper parts and the clay-color of the lower parts in the southern form (Yucatan and Honduras birds). The young males and middle-aged males of the two forms differ in the same way, in general coloration, as the females; in the middle-aged and old males there is the same marked difference in the amount and tone of the black.

The Tampico series is somewhat intermediate between Rio Grande and Honduras birds, but much nearer, as would be expected, to the northern form. They have the same grayish brown dorsal plumage, and the same dull whitish or buffy underparts, but seem to tend in adult males to the development of a larger amount of black on the back and to a deeper tone on the ventral surface in females, and young birds.

Sharpe seems to have properly separated the two forms geographically but referred the northern form to the wrong species. Lawrence in naming this form took for his male type specimen

(Am. Mus. No. 84610), an adult male collected July 21, 1880, at Lomita Ranch, Hidalgo Co., Texas. It has a few black feathers in the pectoral region and many in the back, the specimen being in moult from the immature to the mature plumage. The female type (Am. Mus. No. 84611) is an adult female in fresh spring plumage, taken at Lomita, March 19, 1880.

THE EASTERN FORMS OF *GEOTHYLPIS TRICHAS*.

BY FRANK M. CHAPMAN.

SEVENTEEN years ago, under the above-given title,¹ I described a Florida form of *Geothlypis trichas* as *Geothlypis trichas ignota*, which was later shown by W. Palmer² to extend through the coast region westward to Texas (Jackson County, Jan. 6) and northward to the Dismal Swamp in Virginia.

At the same time Mr. Palmer restricted the name *trichas* of Linnæus to the Yellow-throat breeding from southern New England southward through the Piedmont region into Georgia, while to the Yellow-throat breeding from southern New England northward he applied the name *brachidactyla* of Swainson.

This ruling was accepted as correct by the A. O. U. Committee on Classification and Nomenclature, and we have had, therefore, east of the Alleghanies, three forms of Yellow-throat, a southern, a middle, and a northern. Many ornithologists, however, regarded this view of the nomenclatural status of these birds as far from satisfactory. That there was a Southern Yellow-throat and a Northern Yellow-throat was beyond doubt, but that an intervening form was also deserving of recognition by name has been frequently questioned. This opinion is voiced by Mr. Brewster³ who says: "The characters by which the two forms are said to be separable seem to me trivial and I fear they are also inconstant. . . ."

¹ Auk, VII, 1890, 11.

² *Ibid.*, XVII, 1900, 223.

³ Birds of the Cambridge Region, 1906, p. 354.

In preparing the manuscript for a monograph of North American Mnioiltidae it seemed desirable, therefore, to reconsider the relationships of these birds. To this end Mr. Ridgway has kindly loaned me the pertinent specimens under his charge. I have also had birds from Doctors Bishop and Dwight, and have examined the collections of Mr. Brewster, of the Biological Survey, as well, of course, as the specimens in the American Museum of Natural History.

This material shows that the middle Yellow-throat, the so-called *trichas*, averages smaller and paler than either of the forms south (*ignota*) or north (*brachidactyla*) of it. The differentiation is so slight, however, and is so frequently bridged by variation as to invalidate the claim for distinction by name of this central form.

This, it is true, is a matter of opinion, but in examining the literature bearing on the question an interesting discovery was made which places the whole matter in a new light.

In applying the name *trichas* to the Yellow-throat of the Middle States Mr. Palmer accepted the prevailing opinion that the type locality for this form is Maryland. It appears, however, that this is not the case, the specimen which Edwards¹ figured and described, and which is cited first by Linnæus,² not having come from Maryland but from Carolina! Edwards's (*l. c.*) statement of its origin is as follows: "This bird was the property of Mr. Elliot, Merchant, in Broad Street, London, who received it, with others, preserved in spirits, from Carolina, in North America; and was so obliging as to lend them all to me, to take drawings of them" (*l. c.*). The origin of the name "Maryland Yellow-throat," which Edwards gave to his Carolina bird, as well as the cause for the erroneous belief that his type came from Maryland, is revealed by the remarks which follow the quotation just given. He continues: "J. Petiver, in his *Gazophylacium*, plate VI. has given the figure of a bird, which I believe to be the same with this; for which reason I continue the name he has given it: all he says of it is, '*Avis Marylandica gutture luteo*, the Maryland Yellow-Throat. This the Rev. Mr. H. Jones sent me from Maryland.' Petiver's

¹ Gleanings of Nat. Hist., 1758, I, p. 56, pl. 237.

² Syst. Nat., ed. 12, 1766, 293.

figure is of the same size with mine, and hath such a black line from the forehead drawn through the eye: it hath, I believe, never till now been described, Petiver having given it only a name.

"P. S. Since the writing of the above, I have received the Yellow-Throat, together with a drawing of it, very neatly and exactly done, by Mr. William Bartram, of Pennsylvania, who hath enabled me to give a further account of this bird; for he says, it frequents thickets and low bushes by runs (of water, I suppose, he means) and low grounds; it leaves Pennsylvania at the approach of winter, and is supposed to go to a warmer climate."

The "Carolina" of Edwards, who wrote in 1758, included the North and South Carolina of to-day, his type, therefore, coming from within the range of *ignota*. The question, however, may properly be asked whether Edwards's type was not a migrant and hence, under the current status of this group, either *trichas* or *brachidactyla*. But, assuming that Edwards's type *had* come from Maryland, it might with equal pertinence be asked, how should we know that it was not a migrant *brachidactyla*?

Again it has been said that the present writer refused to accept Audubon's name *roscoe* for a Yellow-throat described from Mississippi as applicable to the form known as *ignota* on the ground that Audubon's type was doubtless a migrant from the north. (It was shot in September). The name *roscoe* was not rejected primarily for this reason, but because Audubon himself, presumably on the basis of actual specimens, referred his *roscoe* to the bird then known as *trichas*, and without positive evidence which would prove him to have been in error we have absolutely no right to reverse his determination.

On the basis, therefore, of locality alone, the name *trichas* is applicable to the southern Yellow-throat heretofore known as *ignota*; but, as a matter of fact, we have something more than mere locality on which to base an opinion, Edwards's figure and description being obviously more applicable to the southern than to the northern bird, while, although this now has no nomenclatural bearing on the matter, Audubon's figure of *roscoe* is quite as certainly *not* based on the southern form.

What then, assuming that this view of the matter is correct, becomes of the form lately known as *trichas*, the Maryland Yellow-throat?

Wilson used the Brissonian name *marylandica* as a pure synonym of *trichas*, with which *personatus* of Swainson is also synonymous. Fortunately, therefore, unless someone desires the questionable distinction of standing as sponsor for the form lately known as *trichas*, we shall not have to consider its claims to nomenclatural standing but may apply Swainson's name *brachidactyla* to all the Yellow-throats north of the range of *trichas* (= *ignota* Chapm.). Thus we shall have in eastern North America:

Geothlypis trichas trichas (Linn.).

SOUTHERN YELLOW-THROAT.

Turdus trichas Linnæus, Syst. Nat., Ed. 12, I, 1766, 293. (Type locality, Carolina.)

Range.—Florida, westward through the Gulf Coast region to Texas; north through the Atlantic Coast region to Virginia (Dismal Swamp); winters from South Carolina southward and also in Cuba (*cf.* Ridgway).

Geothlypis trichas brachidactyla (Swains.).

NORTHERN YELLOW-THROAT.

Trichas brachidactylus Swainson, Anim. in Menag., 1838, 295. (Type locality, "northern provinces of the United States".)

Range.—North America from the "more western portion of the Great Plains" (Ridgw.) eastward, north to Manitoba and southern Labrador, south to the Austroriparian region; winters from the Gulf States southward to the Bahamas, Greater Antilles, Mexico, and Central America.

ORIGIN OF THE FORMS.

An interesting fact developed by Mr. Palmer (*l. c.*) in his discussion of the relationships of these birds is that the central form of the Yellow-throat, to which he restricted the name *trichas*, averages smaller and paler than the form to the north and to the south of it. The extreme northern form of Yellow-throat, therefore, is, apparently, not connected with the southern Yellow-throat by,

so to speak, a graduated scale of regularly arising, cumulative differences, but at their points of contact they are more unlike than at their geographical extremes.

We consequently are led to consider the possibility of the Yellow-throats having acquired their present range through some such method of progress as the Grackles appear to have followed,¹ and an earlier stage of which the Loggerhead and Migrant Shrikes exhibit. An apparently not dissimilar case is afforded by the Parula Warblers, in which the New England form is the same as that found in the Mississippi Valley.

In other words, Yellow-throats may have advanced from Florida northward, and also from the Mississippi Valley eastward and northward; when, as has been said, the Northern Yellow-throat is not a direct geographical offshoot of the southern bird, although both doubtless had a common point of origin. Intergradation, therefore, is not necessarily climatic but follows actual contact occasioned by extension of range.

NOTES ON THE EARLY LIFE OF LOON CHICKS.

BY C. WILLIAM BEEBE.

Curator of Ornithology, New York Zoölogical Society.

Plate II.

ON AUGUST 4, 1906, two eggs were taken from the nest of a Loon, *Gavia imber* (Gunn.), on a lake of the Muskoka District, Ontario. The eggs were cold, and from observation it was judged that the parents had deserted them some 48 hours previously. Packed in a suit-case, the eggs were brought to New York City and on the evening of August 6, one young loon hatched. The following day this chick was brought to the New York Zoölogical Park, together with the second egg, which was chipped.

¹ Cf. Chapman, Bull. Am. Mus. Nat. Hist., IV, 1892, pp. 1-20.



LOON CHICK, 24 HOURS OLD, AND THE EGG FROM WHICH IT WAS HATCHED.



LOON CHICK, 48 HOURS OLD.

Observations made on the two young loon chicks for ten consecutive days revealed a number of interesting facts in regard to the development of their instincts, and these are especially significant and conclusive because the birds had never seen their parents or their natural environment.

August 7.—Chick No. 1 was hardly dry when I took him from his box. Placed on the floor he can make his way about by spasmodic leaps, frog-like, with both feet at once, falling flat on his breast after each effort. Cannot sit upright.

He pecks eagerly at a finger or anything bright, such as a steel instrument. Several small pieces of fish are eaten and he drinks two medicine droppers of water, soon learning to coördinate his vision with his motions of prehension. His eyes are rather dull, appearing covered with a faint bluish haze, and, except at short range, his vision is poor.

At first he strikes out blindly in the direction of the forceps holding the fish, but after a dozen efforts he can seize the bit of food after the first or second trial. He must certainly take his food direct from the parent's beak, and not by regurgitation.

From time to time, when hungry, he utters low peeps, very like a barnyard chick. After he has eaten six small pieces of fish, he seems satisfied and the plaintive, piping note ceases. Instead, occasionally, a half-smothered, whistling sigh is uttered. This sound is made through the nostrils and sounds like *whew-weeo*.

He settles contentedly down on a bed of dampened leaves. Frequently one of the legs is given a violent shake and lifted high up on the side of the body, the wing then being raised and placed over the foot. Again a leg is stretched out straight behind and held in this position for several minutes.

When placed in a deep tub of water the loon chick swims at once, with very quick, short strokes, alternating with first one, then the other foot. While swimming along, without warning, he pushes his head clear under and looks about beneath him. This is repeated several times during his first ten minutes of aquatic experience.

In the afternoon the loon is given a second swim, this time with a hundred small live fish beneath him. Although he ducks his head several times, he does not see, or at least does not notice, the fish.

August 8.—Chick No. 2 is in difficulty, and I have to roll him out of his shell. When first exposed to the world, every down plume is sheathed in a very fine, hair-like wrapping of tissue, reminding one of the covering of a porcupine or of a week-old kingfisher. In about an hour's time these wrappings begin to split at the tips and at the end of three hours the bird seems covered with tiny, palm-like down, with long, stem-like trunks and fluffy, expanded tips. The chick is very restless and frequently rolls over on his back, regaining his normal position only after a scramble. All this action hastens the unsheathing of the down, the protecting tissue covering the chick with a fine dust, myriads of shreds flying off as one flicks the plumage.

Chick No. 2 preens his feathers before being put into water and this instinctive action aids not a little in ridding the down of the sheaths.

Chick No. 1, now two days old, is strong and apparently in excellent health. He is covered with a short, dense down, sooty brown in color, interspersed with a coat of long, black, filoplume-like down. The lower breast, the belly and the entire under surface of the wings are white. In appearance the down is remarkably like the fur of a beaver or otter, when wet as when dry.

The chick weighs four ounces. The length of the culmen is 14 mm., depth of the two mandibles at the rear edge of nostril, 10 mm.; at tip of mandibles, 4 mm. The length of the body when swimming is about 5 inches, and from the tip of the beak to the back of the head, 50 mm. The great difference between the size of the wing and leg is shown in a comparison of the measurements of the two organs; the wing 30 mm., and the tarsus to end of longest toe, 65 mm.

A typical short down bears a close resemblance to that of a thrush; a thick short calamus, giving rise to sixteen branches, rather thickly set with cilia, an average branch having upwards of two hundred. The longer branches are about 20 mm. in length.

When I partly support the body of the chick, it waddles along very readily over the surface of the table. When its head is suddenly immersed in a tumbler of water, its feet and legs instantly respond, moving so rapidly with simultaneous swimming strokes, that they become almost a blur. The arc of motion is almost at

right angles to the normal position of the legs beneath the body, recalling the condition in *Hesperornis*, where a similar side stroke was necessitated by the angle of the juncture of the femur with the pelvis. When the chick squats, the legs approach each other.

In the course of the morning, chick No. 1 swallows six live killifish, each about 2 inches in length. When the loon is swimming quietly about, I intentionally make a sudden movement overhead, and, like a flash, he leaps forward, head first, and dives, coming up after a few hard strokes. He shows no fear of my hand when moved slowly. In fact by moving my hand along and snapping my fingers, he will follow all over the tank, from end to end and side to side, or in circles, wherever I please to lead.

His hearing is very acute and his vision remarkably keen compared with yesterday.

When violent efforts are being made to escape from the rim of a bowl of water, or when the chick swiftly pursues a fish held in the forceps, the alternating stroke changes to a series of powerful, frog-like strokes, given simultaneously with both feet.

When taken from the water and placed on the pile of dampened leaves, which is my imitation loon's nest, the chick at once begins to preen himself. The first instinctive motions are a twitching of the head around to the sides and back in a way so different from any previous actions that my attention is held at once. After the third or fourth time the loon opens his beak and combs several drops of water from his down. After this he preens swiftly and skilfully until most of the water is shaken or dried from the plumage. After the body is well dried, the tail (or rather the tuft of down representing that organ) is shaken vigorously from side to side and the chick stands erect for a moment, wildly flapping his diminutive wings.

August 9.—Loon chick No. 1, on the third day of his existence, after his first swim this morning, immediately seeks and finds his oil gland, instinctively pressing out a quantity of the oil and rubbing it through the wet down of his breast and sides.

Later he picks up a fish which has dropped from the forceps, seizes it by the tail, and, with successive jerks, passes it through his bill until the head is reached, when he swallows it. There is no hesitation, no vague motion; he knows instinctively that the head must be swallowed first.

On the floor he progresses rapidly by the usual frog-like plunges. Between feeds and sleeps, he spends much of the day in attempting to escape over the six-inch wall of his nest box. By noon, he finds a way to achieve this, crooking his head and neck over a corner and kicking his way over. Wire netting is put over the top and he shows no further desire to get out. He eats ten killifish during the day.

Loon No. 2 seems unwell. His eyes are swollen and partly closed and it is not until noon that I discover the cause to be his brother, who makes most vicious lunges at him, when tired of trying to escape. I bathe the head of the chick with boracic acid and separate the two birds for the night.

August 10.—Both chicks are bright this morning. Number 1 eats seven fish before noon, picking up two himself and swallowing them head-first. Number 2 eats four and picks up one, shifting it as skilfully as his brother. Both preen after bathing and use their oil-glands. Their cries, when hungry, are much louder than yesterday.

There is no doubt about the intermittent feud existing between them. They sleep side by side most of the morning, but at noon when I wake them, they fly at each other like game cocks, rolling over and over in a frenzy of pecking. Both take equal parts in the attack. If not separated they would soon destroy each other's eyes. I do not trust them together again except when under observation.

Most interesting is their response to the loud, rolling cry of a Giant Kingfisher, *Dacelo gigas* (Bodd.), in the Bird House. Other loud cries and calls are audible from time to time, especially the notes of a Seriema and a Crested Screamer, but only the notes of the kingfisher affect the young loons. During all the time that this remarkable sound is in progress, the chicks stand or attempt to rear themselves upright, straining their necks and piping their loudest. By concealing myself and imitating the cry of a loon as closely as possible, I am able always to arouse the young birds and set them piping; but the laughter of the kingfisher never fails to throw them into the greatest fits of excitement. I cannot account for it unless it is that some latent instinct in the young loons is aroused by the similarity of the rolling call of the kingfisher to the wild laughter of the adult loons. There is certainly a close re-

semblance between the two, but that these motherless chicks should recognize it is most unexpected.

August 12.—Loon chick No. 2 this morning, made his first attempts at ducking and washing his head and back. The loud, plaintive chirps which they utter are called forth only by the desire for food, or when the kingfisher is heard, when they become too excited to eat.

August 14.—To-day, when one week old, chick No. 1 has caught two dying fish while they swam slowly through the water beneath him. I have made no attempts to teach them to catch fish, feeding them from forceps while in their nest boxes, so that this is an entirely new achievement for him.

Both birds are moulting hundreds of the long, slender, hair-like down feathers from all parts of the body. None of the multi-branched, typical down has as yet loosened.

August 15.—Each bird has eaten twelve fish to-day, most of which they pursued and caught without help. They take great delight in the water, splashing and washing themselves for an hour at a time.

August 16.—A sudden drop in temperature last night has proved fatal to the young loons, and both are dead this morning, with lungs extremely congested. They are well nourished and otherwise in perfect condition.

Loon No. 1 shows the following measurements. Culmen, 16 mm.; bill and head, 57 mm.; wing, 30 mm.; tarsus and longest toe, 68 mm. This shows an increase of growth in all parts except the wing.

CONCLUSIONS.¹

A. It is probable that young loons are, from the first, fed on whole, not on macerated or regurgitated fish.

B. The actions of swimming and preening are instinctive.

C. The method of swimming is usually by alternate strokes. These become simultaneous when a sudden spurt or great speed is desired.

¹ Comparisons are from observations on an adult loon living in the Park last year.

D. The arc of the swimming stroke, in the young chick, is much more lateral than in the adult bird. This is difficult to explain and hard to correlate with the idea that loons and *Hesperornis* are descended from ambulatory species with more typically Avian convergent hind limbs.

E. Loon chicks can progress more easily and rapidly over the ground than can the adults, in spite of the preceding conclusion. Progression, however, is never by walking, but by frog-like leaps.

F. Diving, catching fish and swallowing them head-first are almost congenital instincts, much improved by practice within the first week.

G. There is no instinctive fear in these young birds.

H. It is probable that the young loons instinctively recognize the usual rolling, laughter-like call of the parents, judging from their reaction to the notes of the Giant Kingfisher.

It is interesting to compare these conclusions with several made in connection with Common Terns, *Sterna hirundo* Linn., and Black Skimmers, *Rhynchops nigra* Linn. These were hatched from the egg and reared to maturity in July, 1903, and are now living in the Zoölogical Park.

A. The call, food and alarm notes of Common Terns, Black Skimmers and Laughing Gulls are instinctive; not taught by parents nor learned by imitation. The one positive proof of this would warrant the assertion.

B. The remarkable disparity in the length of the mandibles in the adult Black Skimmer is foreshadowed even in the embryo and in the newly hatched bird.

C. My experience with a dozen terns and gulls showed that these individuals prefer fresh water to salt.

D. There is absolutely no instinctive fear of man or other objects which enter quietly into the environment of the young birds, but a sudden shadow or loud noise causes them to perform certain acts — wholly instinctive — which have for their object an escape from supposed danger. Under such conditions the terns (which are not so protectively colored as the skimmers) take time to run to the darkest corner or shadow before squatting, while the skimmer crouches instantly, and with two or three instinctive flicks of feet and legs, almost buries himself in the sand.

E. The sight of small but entire fish excites the newly hatched skimmer much more than does macerated fish. Terns are not so excited until after the first week.

F. The action of pecking is instinctive to a certain extent, but is acquired very slowly in this way. By imitation it is learned quickly and is performed successfully within a few minutes.

G. Flight is wholly instinctive, the terns learning the use of their wings as soon as the primaries are large enough to support them.

BACHMAN'S WARBLER BREEDING IN LOGAN COUNTY, KENTUCKY.

BY G. C. EMBODY.

BACHMAN'S WARBLER (*Helminthophila bachmani*) first came to my notice April 26, 1905, when two birds, from their song, were mistaken for Worm-eating Warblers. They were feeding in a maple tree situated in a high, dry wood about ten miles northeast of Russellville, Ky., quite an unusual place for *bachmani*, but of the right sort for *vermivorus*.

Although the surrounding country was searched for a likely breeding ground, none was found nor were more warblers seen.

My field work was continued the following spring (1906) and on May 14, I came upon a swamp fairly swarming with warblers, if one were to judge from the great confusion of songs.

These, one by one, disentangled themselves to my ear into the songs of the Cerulean, Parula, Kentucky, Hooded, Black and White, and Blue-winged Warblers and Redstart. But at frequent intervals there were faint trills which in the open might have passed by as coming from the Chipping Sparrow. I counted several of these coming from as many directions and decided that there were Bachman's Warblers about.

The first song was traced to its source only a short distance away

where I found a small bird sitting quietly on an elm branch about fifteen feet up. A distinct black patch on the upper breast certified to its identity as a Bachman's Warbler.

The next bird, I found in the top of a forty foot oak, sitting close to a large horizontal limb. At times the song seemed to proceed from the different trees round about but investigation invariably showed the bird sitting motionless upon the same limb.

It was while trying to locate the third bird that I brushed past some bushes and heard a bird flutter to the ground. I looked down in time to get a glimpse of a bird scurrying along the ground. Unable to identify the bird accurately, or the nest with three white eggs which occupied the same bush, I waited for her to return when she was collected and found to be a female *bachmani*.

The nest was woven into a tangle of cane and blackberry branches about two feet from a slightly elevated bit of ground within a few feet of a pool of stagnant water. Indeed, these black pools were numerous throughout the swamp.

Lined with a few hairs and some dark colored fibers, resembling tendrils, and covered with several layers of dried leaves held firmly in place by interwoven grasses and rootlets, this nest might have been mistaken for that of the Indigo Bunting.

The eggs measure as follows: .655 \times .468, .643 \times .468, .631 \times .474 inches.

The swamp may be characterized as a low bottom which receives considerable back water during the early spring, but in May is drained leaving only stagnant pools. The tulip tree, sweet and black gums, sycamore, elm and various oaks occur in abundance.

About a mile to the southeast is a second swamp, of three hundred acres or more, bordering a creek of considerable size. This was searched for warblers but fewer *bachmani* were found here than in the first swamp. A solitary Prothonotary Warbler was feeding in some bushes in the centre of a large pool, the only one seen in Logan County.

I counted fourteen male *bachmani* in the first swamp and but eight males in the second swamp.

THE NEST AND EGGS OF BACHMAN'S WARBLER,
HELMINTHOPHILA BACHMANI (AUD.), TAKEN
NEAR CHARLESTON, SOUTH CAROLINA.

BY ARTHUR T. WAYNE.

BACHMAN'S WARBLER was discovered by Dr. John Bachman "a few miles from Charleston in July, 1833," and named in honor of him by Audubon, 'Birds of America,' Vol. II, p. 93.

On May 15, 1901, I rediscovered this species in South Carolina, the specimen (an adult male) being taken near Mount Pleasant, and recorded by me in 'The Auk,' Vol. XVIII, July, 1901, pp. 274, 275. Since the rediscovery of this bird on May 15, 1901, I have made every exertion to find others, but it was not until May 14, 1904, that I succeeded in securing another specimen, which was taken on the plantation of Mr. B. B. Furman, in Christ Church Parish, Charleston County.

On May 13, 1905, I discovered three pairs of these rare birds, and succeeded in taking two young that were being fed by their parents. The young male was being fed by the adult male, and the young female by the adult female! The old birds were not molested. These young birds were the first ever taken, and were described by my friend Mr. William Brewster in 'The Auk,' Vol. XXII, October, 1905, pp. 392-394, and also recorded by the writer in the same volume, p. 399. These birds were observed in I'On Swamp, which was named for the late Col. Jacob Bond I'On (of the U. S. Army in the war of 1812), and which is now a part of Fair Lawn plantation, the property of Mr. B. B. Furman.

That this swamp is the type locality where Dr. Bachman took the birds in July, 1833, there can be little doubt, as there is a strong supposition that Dr. Bachman often visited Col. I'On, and may have taken the birds in this swamp.

The first nest and eggs known to science were taken by Mr. Otto Widmann, in the St. Francis River region of southeastern Missouri on May 17, 1897, and described by Mr. Ridgway in 'The Auk,' Vol. XIV, 1897, p. 309. This nest contained three pure white eggs.

During the spring of 1906, I made a special effort to find the nest and eggs of this rare warbler, and knowing that the birds which I had seen and did not molest in 1905 would return to the same swamp to breed the following spring, I determined to devote my entire time with the hope of finding a nest. On April 17 I succeeded in finding two nests, each of them containing *four* eggs. The first nest was placed upon a dead palmetto leaf, being supported by a small aquatic bush, and was completely hidden by a living palmetto leaf which overhung the nest, like an umbrella. It was in a dense swamp, two feet above the ground, and contained four pure white eggs, almost ready to be hatched.

The second nest, which was within one hundred yards of the first one, was built in a bunch of canes (*Arundinaria tecta*), and supported by a palmetto leaf. This nest was three feet above the ground, in a comparatively dry situation, and contained four pure white eggs in an advanced stage of incubation. The females were incubating when the nests were found, and I could scarcely realize that I had at last found the nest and eggs of Bachman's Warbler, for which I had looked in vain for nearly twenty-five years, in almost every swamp from the neighborhood of Charleston to the Savannah River.

The female is a very close sitter; indeed so close that I found it necessary to touch her before she would leave the nest. This habit was the same in both females. Having carefully marked the nests, I searched the swamp for others, but was unsuccessful that day. Upon returning to the nests about three hours later, the females were still incubating, and would not leave until they were actually touched with my finger.

The two nests are similar, being constructed of fine grass, cane leaves, and other leaves, the latter skeletonized. The second nest, taken April 17, is $6\frac{1}{2}$ inches high, 6 inches wide, 2 inches wide at rim, and 2 inches deep. It is composed almost entirely of dead cane leaves, a little Spanish moss (*Tillandsia usneoides*), and a few skeletonized leaves. The eggs measure $.60 \times .47$, $.61 \times .46$, $.62 \times .46$, $.61 \times .47$ inches. This nest and four eggs is now in the collection of my friend Col. John Eliot Thayer of Lancaster, Mass.

Knowing that the birds would at once commence to build new

nests, I visited the place almost daily with the hope that I would be successful in finding them; but in this I was mistaken, for while it was comparatively easy to locate the singing males, it was next to impossible to observe the females; in fact, the females were not observed except when they were feeding young birds, and those were not the birds that I had deprived of their nests and eggs. As far as I was able to determine, there were but four or five pairs of these rare birds in the greater portion of the swamp that I explored most thoroughly.

On April 28, I found a nest which contained one young bird, apparently five or six days old, and secured it on May 9 while it was being fed by its parents. This young bird could fly with ease, although the tail was not half developed. The nest which contained the young bird was built in a low bush about three feet from the ground, in the densest part of the swamp, and was within ten or twelve feet of a Swainson's Warbler's nest that contained three eggs. This nest is large and bulky. The foundation is composed of Spanish moss, with distinct layers of skeletonized leaves, interspersed with leaves of the cane and pine needles, which appear at and around the rim.

A deserted nest, which contained three eggs, was found on May 9, in a bunch of blackberry and canes (vertical shoots), within one foot of the ground, on the edge of the swamp and within twelve feet of a Swainson's Warbler's (*Helinaia swainsonii*) nest that contained four eggs. The foundation of this nest is Spanish moss, while skeletonized leaves, a few small twigs, and dead cane leaves constitute the other materials. The interior of the nest is 2½ inches in depth.

On May 12 I found an exquisite nest, placed on a vine and within one foot of the ground, from which the young had evidently but recently flown, as I encountered them in the near vicinity. It is constructed chiefly of a species of moss (*Hypnum*) that grows on low bottom lands more or less covered with water. Interspersed among this moss are dead leaves which are partially skeletonized, as well as a few dead cane leaves. This nest is almost a perfect circle.

The sixth and last nest (from which the young had long since left) was found on June 2, in a low bush, within two feet of the

ground, in a dense thicket in the swamp. It is composed of grasses, parts of skeletonized leaves and pine needles.

All of the six nests that I found are lined with a peculiar black fibre which may be the dead threads of the Spanish moss (*Tillandsia usneoides*) or a black rootlet. The lining of the nests taken on April 17, while very lustrous black, cannot belong to the Spanish moss, which is very distinctly jointed, and I cannot discover any joint whatever in this substance. The nest taken by Mr. Widmann on May 17, 1897, was apparently lined with the same material. In many respects the nest of Bachman's Warbler is very similar to that of Swainson's Warbler.

This species is eminently a swamp lover during the breeding season. The song is wiry or insect-like, and very closely resembles the song of the Worm-eating Warbler, while it also bears a strong resemblance to the songs of the Parula Warbler and Chipping Sparrow.

Although I practically lived in the swamp from April until June 19, in order to determine whether the birds raise two broods, I am convinced that only one brood is raised, as this species is a very early migrant after the breeding season, it having been taken at Key West by Mr. J. W. Atkins as early as July 17.

As the bird is very rare in this State, I am unable to give the dates of its arrival and departure — that is the earliest and latest ones — but I heard a male singing on April 4, 1905, and I think I saw two males about the middle of March. The song of the male is evidently of short duration, as I have not heard it sing later than May 26. The female has no song and its call-note resembles the word *zeep*.

A young male taken May 30, 1906, while partly in the first plumage, and first winter plumage on the back and sides, was, however, assuming the black markings on the jugulum and fore breast of the adult male, while the crown was ashy instead of black. In 'The Auk,' April, 1891, p. 156, Mr. Brewster states: "Our males, thirty-six in number, vary exceedingly in respect to the depth and extent of the black of the head and throat, but most of the black feathers are narrowly tipped with ashy or olive yellow which doubtless disappears later in the season." Mr. Brewster's specimens were taken in March. My breeding males all show the olive yellow edging on the black feathers.

The swamp in which this warbler breeds is heavily timbered and subjected to overflow from rains and reservoirs. The trees are chiefly of a deciduous character, such as the cypress, black gum, sweet gum, tupelo, hickory, dogwood, and red oak. In the higher parts of the swamp short-leaf pines, water oaks, live oaks, and magnolias abound. The undergrowth is chiefly cane, aquatic bushes, and swamp palmetto, while patches of blackberry brambles and thorny vines are met with at almost every step. This primeval forest is flanked on the western side by an enormous reservoir, the water of which is used to flow the rice fields that are in close proximity to the swamp. The entire country is very swampy, but Bachman's Warbler appears to inhabit only a restricted area in one of the many swamps. While I have searched for the bird most diligently in localities which seemed in every respect suitable to its wants, I have met with it only near the reservoir where buttonwood bushes were growing near the edge of the forest. In order to study the habits of this warbler one must be prepared to encounter armies of ticks, red bugs, mosquitoes, and moccasin snakes, with which these dark and gloomy woods are filled.

Bachman's Warbler is a high-ranging bird, like the Yellow-throated Warbler, and generally sings from the top of a sweet gum or cypress. It appears to have regular singing stations during the breeding season, and upon leaving a tree it flies a long distance before alighting. On this account it is impossible to follow the bird through the dark forest, and it can only be detected by its song. I have occasionally seen the males in low gall-berry bushes within six or eight inches of the ground, but their usual resorts are among the topmost branches of the tallest forest trees.

This swamp is a veritable paradise for such breeding forms as the Hooded, Parula, Yellow-throated, Prothonotary, and Swainson's Warblers. The Hooded Warblers are the commonest breeders and they outnumber all the other swamp-loving birds. During the months of April and May the song of thousands of breeding birds, as well as of migrants, fill the swamp with all kinds of music, the finest singers being Swainson's Warbler and the Wood Thrush.

It is difficult to understand what becomes of the vast number of young birds which are annually reared in this swamp country. It seems certain that fully 50% do not return the following spring to breed, for if they did the woods would be simply filled with them.

Since Bachman's Warbler was discovered in 1833 but seven nests have been recorded — one taken by Mr. Widmann on May 17, 1897, and the six which I have described. There is, I believe, another nest and three eggs in the collection of Mr. J. Parker Norris, Jr., that were taken by Mr. Widmann in Missouri, but I am of the opinion that this has never been recorded.

PRELIMINARY LIST OF THE SUMMER BIRDS OF THE
COBALT MINING REGION, NIPISSING
DISTRICT, ONTARIO.

BY FREDERICK C. HUBEL.

THE following annotated list of birds is based on observations made within a radius of ten miles of what is now known as the town of Cobalt, Nipissing District, Ontario, by Mr. J. Wilbur Kay and myself between July 15 and August 18, 1905. Cobalt, situated on Cobalt Lake, is about 100 miles from North Bay junction on the transcontinental line of the Canadian Pacific, and 330 miles almost north of the City of Toronto. When we entered this region, Cobalt was merely a small mining camp consisting of about two dozen huts, a few stores and a station. It has since grown to be a mining town of considerable size, owing to the large deposits of silver for which this region is now famed.

About three miles south of the town is the Montreal River. There are numerous lakes in this region. Lake Temiskaming, by far the largest, lies but a few miles to the east, and although this lake has been a well traversed route to the north by white men for the past two hundred years or more, very little ornithological data has come to light from this region.

This country is a rocky wilderness, much of the field being covered with drift deposits and the exposures of compact rock are

frequently clothed with moss. Here and there hills with steep faces rise to a height of a hundred feet or more. Although lumbering operations have been conducted over almost all of this area, very few clearings exist, as the surface is unfit for agriculture. Here and there forest fires have left their ghastly trails behind.

Among the principal forest growths are Norway, white and jack pine, tamarack, cedar, balsam, and other hardy timber. The second growth is usually birch and poplar, principally the former. The small shrubs are of various species. Although the shores are generally rocky and wooded to the water's edge, considerable marsh land is to be found which affords suitable breeding grounds for water-fowl. The largest of these is at the head of Lake Temiskaming, which covers several hundred acres.

While the present list is in no sense complete, I have preferred to exclude many species which in my mind were doubtful, especially where specimens could not be procured.

1. **Gavia imber.** LOON.—Nearly every day one or more of these birds were observed flying over the lakes. They undoubtedly breed.

2. **Larus argentatus.** HERRING GULL.—Common on Lake Temiskaming. We were told by a native that they breed on a small island at the upper end of the lake. Also observed on Cross Lake.

3. **Aythya affinis.** LESSER SCAUP DUCK.—Several birds observed with their young on Lake Temiskaming.

4. **Branta canadensis.** CANADA GOOSE.—One observed flying over Cross Lake on August 2.

5. **Botaurus lentiginosus.** AMERICAN BITTERN.—Common about the marsh land of all the lakes.

6. **Ardea herodias.** GREAT BLUE HERON.—This species is very common, especially along the marshy creeks where they feed.

7. **Actitis macularia.** SPOTTED SANDPIPER.—The tip-up is abundant along the rocky creeks and along the beaches of the surrounding lakes.

8. **Dendragapus canadensis.** CANADA GROUSE.—Common throughout the timber lands. Many females were observed with their young.

9. **Accipiter velox.** SHARP-SHINNED HAWK.—One bird observed August 2 on a telegraph pole about half a mile below Cobalt. This was the only one met with.

10. **Accipiter cooperi.** COOPER'S HAWK.—A large adult of this species was observed August 12.

11. **Haliaeetus leucocephalus.** BALD EAGLE.—One adult flew over Cobalt Lake, July 18.

12. **Falco sparverius.** AMERICAN SPARROW HAWK.—Four of this species were seen along the railroad south of Cobalt.

13. **Megascops asio.** SCREECH OWL.—One bird of the reddish phase seen in a tamarack swamp near Cobalt Lake.

14. **Bubo virginianus.** GREAT HORNED OWL.—A Frenchman in Cobalt secured three young from a nest near by and put them in a cage. The parent birds visited the cage every night.

15. **Ceryle alcyon.** BELTED KINGFISHER.—Several pairs observed every day. Breeds.

16. **Dryobates villosus.** HAIRY WOODPECKER.—Single individuals were met with every day or so.

17. **Dryobates pubescens.** DOWNY WOODPECKER.—This species was abundant in all sections.

18. **Picoides arcticus.** ARCTIC THREE-TOED WOODPECKER.—This species was found abundant in all sections visited. Undoubtedly the most common woodpecker.

19. **Picoides americanus.** AMERICAN THREE-TOED WOODPECKER.—But two birds seen, on August 8 and 11, near Cross Lake.

20. **Sphyrapicus varius.** YELLOW-BELLIED SAPSUCKER.—Fairly abundant at all times. Breeds.

21. **Ceophloeus pileatus.** PILEATED WOODPECKER.—Three of these birds were met with July 30, near Haileybury.

22. **Colaptes auratus luteus.** NORTHERN FLICKER.—Rather common about the less thickly timbered land.

23. **Chordeiles virginianus.** NIGHTHAWK.—An abundant species throughout this region. Two heavily incubated eggs were found July 17 on a rocky ridge near Cobalt Lake.

24. **Chaetura pelagica.** CHIMNEY SWIFT.—Abundant about the lakes. Many seen in Haileybury where they nest in chimneys.

25. **Trochilus colubris.** RUBY-THROATED HUMMINGBIRD.—Only noted once, July 19, near Sasaginaga Lake.

26. **Tyrannus tyrannus.** KINGBIRD.—Fairly abundant about the lakes and along the creeks. Young birds seen late in July.

27. **Nuttallornis borealis.** OLIVE-SIDED FLYCATCHER.—One specimen was secured August 8. A few single individuals were met with previous to this date.

28. **Contopus virens.** WOOD PEWEE.—Although but few were observed, we heard them quite frequently.

29. **Empidonax flaviventris.** YELLOW-BELLIED FLYCATCHER.—Two of this species were met with July 29, being the only ones seen.

30. **Empidonax minimus.** LEAST FLYCATCHER.—One adult male taken August 7.

31. **Cyanocitta cristata.** BLUE JAY.—Fairly common; observed every day.

32. **Perisoreus canadensis.** CANADA JAY.—This bird was not met with during July or August. Kay found it common after the middle of September.

33. **Corvus corax principalis.** NORTHERN RAVEN.—Fairly common.

34. *Corvus brachyrhynchos*. AMERICAN CROW.—Abundant.
35. *Agelaius phoeniceus*. RED-WINGED BLACKBIRD.—Three observed in a marsh near Cross Lake, August 6. Although the same marsh was visited several times later, we did not see them again.
36. *Euphagus carolinus*. RUSTY BLACKBIRD.—One pair observed at Short Lake. We visited the same lake later several times and on each occasion both birds were seen flying back and forth along the shore carrying food. They were undoubtedly feeding young.
37. *Quiscalus quiscula æneus*. BRONZED GRACKLE.—Fairly abundant.
38. *Carpodacus purpureus*. PURPLE FINCH.—One pair met with in Cobalt, July 15.
39. *Loxia curvirostra minor*. AMERICAN CROSSBILL.—Many large flocks met with. While walking up the railroad from Cobalt one day, a large flock alighted on the trees about us. They showed absolutely no fear, one bird attempting to alight on the end of a canoe paddle which I was carrying over my shoulder, and on the same occasion several flew by within two or three feet of us.
40. *Astragalinus tristis*. AMERICAN GOLDFINCH.—Regularly met with about the partially cleared sections.
41. *Poœetes gramineus*. VESPER SPARROW.—Only one seen, July 30, in a small clearing near Haileybury.
42. *Zonotrichia leucophrys*. WHITE-CROWNED SPARROW.—A few single individuals noted. Seen feeding young, July 17.
43. *Zonotrichia albicollis*. WHITE-THROATED SPARROW.—Probably the commonest bird in this region. Eggs and young observed.
44. *Spizella socialis*. CHIPPING SPARROW.—Only one met with, August 4.
45. *Junco hyemalis*. SLATE-COLORED JUNCO.—Abundant. Breeds. Eggs and young observed.
46. *Melospiza cinerea melodia*. SONG SPARROW.—Regularly met with about the clearings.
47. *Petrochelidon lunifrons*. CLIFF SWALLOW.—Found only at North Temiskaming, where they are quite common.
48. *Hirundo erythrogastra*. BARN SWALLOW.—Common at Haileybury. Breeds.
49. *Iridoprocne bicolor*. TREE SWALLOW.—Regularly met with about the various lakes.
50. *Ampelis cedrorum*. CEDAR WAXWING.—Generally distributed.
51. *Vireo solitarius*. BLUE-HEADED VIREO.—Only one met with, July 15.
52. *Mniotilta varia*. BLACK AND WHITE WARBLER.—Once met with, August 7.
53. *Helminthophila ruficapilla*. NASHVILLE WARBLER.—Only one met with, August 12.
54. *Compsothlypis americana usneæ*. PARULA WARBLER.—Three recorded, two August 5 and one August 11.

55. *Dendroica tigrina*. CAPE MAY WARBLER.—One adult male met with August 12.

56. *Dendroica æstiva*. YELLOW WARBLER.—Four single individuals met with the latter part of July.

57. *Dendroica cærulescens*. BLACK-THROATED BLUE WARBLER.—Fairly common during the latter part of July, more so in August.

58. *Dendroica blackburniæ*. BLACKBURNIAN WARBLER.—Several met with. Observed feeding young, July 7.

59. *Dendroica maculosa*. MAGNOLIA WARBLER.—Only met with once, July 24.

60. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.—Once met with, July 26.

61. *Dendroica vigorsii*. PINE WARBLER.—Several met with during the early part of our stay.

62. *Seiurus auropallidus*. OVEN-BIRD.—Four single individuals met with during the latter part of July. Not seen later than August 1.

63. *Seiurus noveboracensis*. WATER THRUSH.—But one observed, August 2.

64. *Geothlypis trichas brachidactyla*. NORTHERN YELLOW-THROAT.—Once met with, July 19.

65. *Wilsonia canadensis*. CANADIAN WARBLER.—Very abundant. Breeds.

66. *Setophaga ruticilla*. AMERICAN REDSTART.—Three single individuals met with, July 18, July 23, August 7.

67. *Troglodytes ædon*. HOUSE WREN.—Twice met with, August 4.

68. *Cistothorus palustris*. LONG-BILLED MARSH WREN.—Met with several times on a marsh near Cross Lake. Undoubtedly the same pair observed each time.

69. *Certhia familiaris americana*. BROWN CREEPER.—Very abundant everywhere.

70. *Sitta canadensis*. RED-BREASTED NUTHATCH.—Fairly common.

71. *Parus atricapillus*. CHICKADEE.—Very abundant everywhere.

72. *Regulus satrapa*. GOLDEN-CROWNED KINGLET.—Fairly common. Observed feeding young, July 28.

73. *Turdus fuscescens*. WILSON'S THRUSH.—Several single individuals observed.

74. *Merula migratoria*. AMERICAN ROBIN.—Fairly common about the partially cleared sections.

75. *Sialia sialis*. BLUEBIRD.—Fairly common.

76. *Passer domesticus*. ENGLISH SPARROW.—Very common at Haileybury.

UNPUBLISHED LETTERS OF JOHN JAMES AUDUBON AND SPENCER F. BAIRD.

BY RUTHVEN DEANE.

III.¹

AUDUBON TO BAIRD.

New York, Nov. 29, 1842.

My dear Young Friend,

It seems to me as if an age had already elapsed since I have heard of you or your whereabouts. Neither do I know clearly whether in the way of correspondence, you are in my debt, or I am in yours. Nevertheless I now write to you, and request you to read this letter more than once, and think deeply on the purport of its contents that you may be the [more] able to form a true Idea of what I intend to say [to] you, and for yourself to give me a true answer, and on which I can depend, no matter whether it is to my liking or not.

It is now determined that I shall go towards the Rocky Mountains at least to the Yellowstone River, and up the latter Stream four hundred of miles, and *perhaps* go across the Rocky Mountains. I have it in my power to proceed to the Yellowstone by Steamer from St. Louis on the 1st day of April next; or to go to the "*Mountains of the Wind*" in the very heart and bosom of the Rocky Mountains in the company of Sir William Drummond Stewart,² Baronet who will leave on the 1st of May next also from St. Louis.

It has occurred to me that perchance you would like to spare a few months of your life, to visit the great Western Wilderness, and perhaps again prefer going in my Company in preference to that of any other person? Of this of course I cannot Judge without your answer to this. I thought that you would have been in New York long ere this, but not a Word of you has reached any friend of yours here for several months. I have had an abundance of applications from different sections of the country, from Young

¹ For Parts I and II see Auk, Vol. XXIII, 1906, pp. 194-209 and 318-334.² William Drummond Stewart (7th Bart.); born 1795, died 1871.

Gents who proffer much efficiency, etc., but I do not know them as I know you, and if the terms which I am about to propose to you will answer your own views, I wish you to write to me at once so that I may know how to prepare myself for such a Journey, and under such circumstances.

Would you like to go with me at any rate? By which I mean, whether by Land, or by Water, and undertake, besides acting towards me as a friend, to prepare whatever skins of Birds or Quadrupeds, I may think fit for us to bring home. The Birds, you might have one half as your own, the Quadrupeds, (should you wish it) you might a 4th or every 4th specimen of the same species, reserving to myself all that is new or exceedingly new.

I will procure and furnish *all the materials* for skinning, preparing, and saving whatever we may find in Ornithology and in Mammalia, and in all probability (if you think it absolutely necessary) pay one half your expenses from the time we leave St. Louis until our return to that city. You will have to work hard, of course; but then I trust that the knowledge alone which you must acquire would prove a sufficient compensation, and as you already know me pretty well, I need not say to you that I am not hard on the nigger.

It will be necessary for you to provide a good double barrelled Gun, and an excellent Rifle, Shot bag, powder flask, &c, a good hatchet, and a sufficiency of clothes for something like a 12 month's Campaign. But if you will write to me at once upon the subject, I can give you a more and a better a / c of all my intentions, than is at present necessary.

If all goes on as I trust it will go on, we may be back home by Octr. or Novr. next, 1843.¹

Do not lose a moment in writing to me in answer to this after you have thought *deeply* upon the matter.

Remember me kindly to all your friends, and believe me,

Yours Always,

John J. Audubon.

77 Williams Street, New York.

¹ The Missouri River Expedition occupied the period between March 11, 1843, and November 6 of the same year. Baird did not accompany Audubon. He had corresponded with him four months before on this same subject, as shown in a letter which I published in 'The Auk' (Vol. XXI, April, 1904), stating that nothing would delight him more than to go, if he could afford it.— R. D.

BAIRD TO AUDUBON.

Washington, November 24th, 1843.

My dear Mr. Audubon

It has been with the greatest pleasure that I have heard by the papers of your safe arrival in a civilized part of the country, with your collections in all departments of Natural History.¹ That these have been extensive I can have not the least doubt, as you are not a person to be idle when anything is to be done. From time to time short notices of your whereabouts and doings, appeared in the newspaper and a thousand times I wished that the fears of my friends had not prevented me from accompanying you to the scenes of action. Will you not, if you have time, write & tell me what your success has been, and what new birds & beasts you have discovered? Nothing but vague rumors have reached me of these matters. Is there anything I can do for you here? Will you not be on yourself after the meeting of Congress?. Please enclose anything for me under cover to "Charles B. Penrose,² Solicitor of the Treasury, Washington."

Yours Sincerely

Spencer F. Baird.

John J. Audubon Esq.

BAIRD TO AUDUBON.

Carlisle, March 9th, 1844.

My dear Mr. Audubon

I would have replied ere this to your last two letters, but for waiting for further information respecting the Pennant's Marten. I have at last got a full account of the animal, its price &c. The owner is very unwilling to part with it, having formed the most extravagant ideas of its value and rarity. He has already realized a considerable sum of money by exhibiting it in Harrisburg, and intends making a tour through the neighboring towns for the same purpose. He however said that I might have it for ten dollars, if I would pay for the box he had made to contain it. The box is large, and convenient, having iron bars on one side, & iron fasten-

¹ Missouri River expedition, which occupied the time between March 11 and November 6, 1843.

² Charles B. Penrose of Pennsylvania, Solicitor of the Treasury from 1841 to 1845, appointed to Office by President William H. Harrison.

ings on the other, with a sliding door to shut it up completely. This cost 5 dollars? The man says he has not got the skin of the old one but will try and get it, he thinks he can do so, when he will let me have it with the live one. If therefor you conclude you want the Marten, please to send me the 15 dollars which can be done in a letter. I had hoped to have been able to have purchased it and presented it to you; but the price is far above my present means having used up all my "spare change" during an expensive three months absence from home. I can send it very safely to Philadelphia, as I have a very obliging acquaintance among the forwarding merchants here, who goes down himself twice every week, and who would take great pleasure in feeding the animal on the road and delivering it safely at Hall Brothers. I have some skins collected here which are at your service. They are *Sciurus Cinereus*?¹ ferruginous above & black beneath, *Lepus Sylvaticus*,² & a very rough specimen of *Hystrix dorsata*³ caught in Clearfield Co. Penn. I do not notice in your list of birds to be published in your supplement the *Turdus Minor* of Gm.⁴ indicated in Fauna Bor. Am. It is certainly a well characterised species and abundant in our mountains in spring. It comes with Wilson's thrush but in a tenfold number. I can send you very good specimens if you wish them. How are your new birds to be published and if in the small edition, can they be bought separately. You ask whether I shall be in New York before you go to Boston. I shall not leave Carlisle for several months. It is exceedingly probable that I shall go on a long threatened trip to the coal regions of Schuylkill Co. this summer. If I do I hope to render you some tangible evidence of my having been there in the shape of specimens and notes. Hoping to hear from you soon I remain

Yours Sincerely

Spencer F. Baird.

John J. Audubon Esq.
77 William St.
New York.

¹ *Sciurus niger* Linn.

² *Lepus floridanus mallurus* Thomas.

³ *Erethizon dorsatum* Linn.

⁴ *Turdus fuscescens*: In the early days "mix up" on the genus *Turdus*, "Swainson called it *T. minor* after Gmelin, and applies the name *wilsonii* erroneously to *T. swainsonii*." (Bds. N. A.)

BAIRD TO AUDUBON.

Carlisle March 16, 1844.

My dear Mr. Audubon.

I have the Pennant's Marten¹ safely in my possession having just returned from Harrisburg with it, whither I had gone for the purpose of procuring it. It seems in very good health, and is without exception the most unmitigatedly savage beast I ever saw. The Royal Bengal Tiger, or the Laughing Hyena are neither of them circumstances to it. It goes through all the motions of a mad cat, particularly when a dog comes near, — spitting, hissing, growling etc.

All the account I was able to procure respecting the animal was the following. It was found in company with an older one, in Peter's mountain, six miles above Harrisburg about five weeks ago. After a most desperate resistance the old one was killed, having beaten off a large pack of dogs, to whose assistance the hunters were obliged to run. This individual ran up a tree, and being stoned by the men, jumped off to a distance of forty feet! when being a little stunned by the leap they ran up quickly and threw their coats over it, and then secured it. The old one measured three feet and a half from nose to end of tail, and was about one third larger than this.

I am looking out for a good chance to send the Marten on to you which I hope will be early next week. There will be cars going on Monday & Tuesday, to Philadelphia, but on Wednesday a man goes down with his own car to whom I can entrust it safely to feed and water.

I will send on a few other skins I have here with the Marten. A small shrew from Cape May, Squirrel, etc. If they leave on Wednesday they will arrive on Thursday evening it taking two

¹ In the 'Viviparous Quadrupeds of North America,' under the article on Pennant's Marten, Audubon writes: "The specimen from which the figure of our plate was drawn, was taken alive in some part of the Alleghany Mountains, in the State of Pennsylvania, and we soon afterwards received a letter from our esteemed friend, Spencer F. Baird Esq., of Carlisle, in that State, informing us of its having been captured, which enabled us, through that gentleman, to purchase it. His letter was dated March 16, 1844."

days to go. I will send a notice of the transmission to Hall Brothers¹ when I send it off.

Yours sincerely

Spencer F. Baird.

John J. Audubon Esq.
77 William St.
New York.

BAIRD TO AUDUBON.

Carlisle August 4th. 1845.

My dear Mr. Audubon

It is with sincerest regret that I see by the papers that your copper plates² were injured or perhaps ruined by the fire which occurred a few weeks ago. Various reports are circulated respecting your loss, and among so many contradictory ones it is difficult to get at the truth of the case. Might I ask you to let me know the truth of the matter. I would have answered your last letter long ago, but was waiting for information respecting the Northern hare, for which I have applied to several persons in different parts of the state. None has come in yet, but I hope to get some before long. The animal is not found in this county & is very rare in the one north of this. In Huntingdon Centre, Clearfield Co. they are more common. I wrote to my friend in Texas about the large prairie hare, & I hope he will be able to render the proper account of it. I called his attention also to the other quadrupeds of the country, and I hope to hear from him soon, & expect that he will

¹ Hall Bros., Merchants and Importers, 43 Beaver St., New York.

² The copper-plates, engraved by Robert Havell, for the folio edition of 'Birds of America,' were stored in a New York warehouse in 1845, where many of them were seriously damaged by fire. Miss M. R. Audubon writes me that in 1851-52, when her grandfather's new house was built, a fireproof vault, detached from the other buildings, was put up for them, and there they remained until after the death of her father in 1862, when they were sold. Two of these plates, in perfect condition, are now in Miss Audubon's home at Salem, N. Y. They represent the Great White Heron and Snow Goose. Six plates, in the Smithsonian Institution at Washington, D. C., represent the Robin, Chuck-wills-widow, Bob-white, Great Blue Heron, Scarlet Ibis, and Whooping Crane. Nine plates, in the American Museum of Natural History, New York City, represent the Canada Goose, Hutchins's Goose, Mallard, Turkey (female), Loon, Snowy Owl, Hawk Owl, Harris's Hawk, and Black-footed Albatross. There are several other plates in private hands at Ansonia, Conn. (R. D.)

remain some time longer. Is there any particular point to which you wish his attention directed. With my best respects to all your kind family I remain

Yours Sincerely

Spencer F. Baird.

P.F.S.

I forgot to say that I have been elected professor of Natural History in Dickinson College. The situation is entirely nominal however, nothing to do & no salary whatever.

John J. Audubon. F. R. S.
77 William St.
New York.

BAIRD TO AUDUBON.

Carlisle Sept. 26. 1845.

My dear Mr. Audubon

I hasten to communicate to you some information which I have obtained of the Northern hare, although in all probability you are well acquainted with what I have to say. My informant is Mr. Andrew H. Rose of Silver Lake Susquehanna Co. Penn., where game of all kinds is abundant. He is now in Carlisle, and any queries you might make respecting the animal, on subjects not mentioned in his communication, he could answer to your satisfaction. Among the animals in his neighborhood, he speaks of a Catamount!!, a varmint twice as large as the wild cat, tail 18 inches long, and unspotted. i. e. the body. Very different from the young panther, with which he is well acquainted. There was a skin in his neighborhood, which he has written for. He is not very sanguine of getting it, if it is not procurable his brother will try very hard to get another. He promises me skins of Wild Cats, Cross foxes, Fishers, a Red Squirrel, twice as large as a Chickaree, living in deep swamps, and Hares in various plumages. He killed several Silver Foxes, last winter and will try and get one if possible. He says they bring 35 dollars from the dealers in Montrose. If I should be so fortunate as to get anything interesting through him it shall be sent on immediately, as my sole object in

collecting quadrupeds is to put them into your hands. I have been thinking very seriously of going to Texas this winter for some months, and possibly nothing but the want of money will prevent me. An acquaintance is anxious for me to pay his uncle a visit, who resides in summer on Galveston Bay, in winter about 100 miles along on Trinity River. I shall keep a sharp lookout for quadrupeds if I go. Please present my best respects to your family, and believe me as ever

Yours Most Sincerely

Spencer F. Baird.

Memoranda of the Nat. Hist. of *Lepus americanus*, Erx.

In cold weather found in Lustral swamps. Never seen in large open woods, nor in extensive clearings. In summer in bushy places near clover patches, in the edges of which they have their nests. Young from three to five, gray. Nest sometimes under a log, made of leaves and some fur. Feed on clover in summer, on bark of birch, beech, wild poplar, and striped maple. Change in November, and April. Two very rarely seen together. Caught in snows in great quantity, during winter, and sent to New York. Worth from 8 to 10 cents in Susquehanna Co. Favorite time of running is on moonlight nights. Never burrow. Run very rapidly, leaping from 5 to 8 feet or even more when pursued, more faster than Foxhound, but are caught by Grey-hounds. Have favorite paths for crossing over roads, or from one patch of woods to another. In winter they form a beaten track six or more inches in the snow. When pursued by hounds they soon double and come back to place from which they started. When chased they will often mount up on a small knoll in woods, and listen and watch for their pursuers. If whistled at when running, they will stop for an instant. Preyed on by Wild Cats, Foxes, Weasels, Hawks, Eagles, Owls &c. Foxes have been known to hunt them in pairs, one chasing, the other watching near a crossing place. Very abundant, 10 to 50 may be seen in a day. Common rabbit very rare, their existence traditionary.

BAIRD TO AUDUBON.

Carlisle Dec. 29, 1845.

My dearest Mr. Audubon

It is with no ordinary feeling of pleasure that I received your kind Christmas gift in the shape of a letter written on the 25th, than which, few things in this world could have pleased me more. I would have answered the preceeding one long before, had I not been waiting for something to write in answer to your queries. As to procuring a specimen of the Catamount and Black Fox in the flesh, it is an exceedingly difficult matter. I however will do what I can. Of course none are to be procured in this vicinity. I however write today to Mr. Andrew Rose of Silver Lake Susquehanna Co. Pa., who is now at home, for the purpose of inducing him to make every effort to procure one or both animals. He has several times spoken to me of the black fox as being occasionally captured in his vicinity and when he went up home a few weeks ago, promised to get me one if possible. He, I have no doubt, will make every effort to get it, as well as the other, if it really has a veritable existence. My friend Charles Churchill son of Col. Churchill wrote to a friend of his in Burlington, Vt. for a similar purpose, whether one could be procured in the flesh and on what terms, also to collect every information respecting the habits and manners of the Fisher &c. You ask me how I have been employing my time. I have been occupied this winter principally in studying modern languages, German, Spanish and Italian in which I hope I made some progress. Besides this I draw a little every day, principally sketches of boxes, tubs, boats, castles &c. not from nature. My principal object is to be able to copy off some of the beautiful landscapes which I am constantly meeting with in my walks. I visited a spot last summer about 18 miles from Carlisle, whence a surface of about 1500 square miles of cultivated valley was visible at one glance.

A line of very near 100 miles could be traced in the length of the valley. The rest of my time is occupied by mathematics general reading & visiting a young lady. I have been for some time studying out our little flycatchers, and have come pretty nearly to the conclusion that my *Tyrannula minima* is very like Swainson's *T.*

pusilla. His figure and description are different from my bird, but both are vague enough to allow of considerable latitude of interpretation. I can only decide the matter by looking at your plate of *pusilla*. Do you still think that *Tyrannula richardsonii* is a good species? In about 20 specimens of *T. fusca* which I possess, there is every gradation in size, color, & proportion of quills between the descriptions of *Fusca* and *richardsonii*. If there is any infallible distinctive character, please mention it to me. The eggs and habits appear at any rate to be very different from their descriptions.

If I have time I will write out a monograph of our Flycatchers for the Proceedings of the Academy of Nat. Sciences, for the purpose of giving the correct names of Giraud's Texan species.¹ [His] *Muscicapa Texensis* for instance is nothing but the old *M. cayanensis* of Brisson² & Gmelin, *M. flava* of Vieillot,³ and so of others. If my purse is deep enough towards the end of the winter, I may possibly be able to meet you & talk over these matters. In the mean time Believe me to be, with my respects to Mrs. A. and all your family

Yours most affectionately

Spencer F. Baird.

John J. Audubon Esq.

77 William St.

New York.

BAIRD TO AUDUBON.

Carlisle Feb. 4th, 1846.

My dear Mr. Audubon

I am sorry to be obliged to report such ill success in getting the animals you wished, although I have done everything in my power. My friend who went to Susquehanna Co. returned without anything more than a box of Salmon trout and a few *Lepus americanus*, which are so abundant. By the way I do not want you to consider

¹ 'A Description of Sixteen New Species of North American Birds.' 1841. *Muscicapa texensis*, folio 5, pl. 1.

² 'Ornithologia sive Synopsis Methodica.' 1760. *Muscicapa cayanensis*, Vol. II, p. 404.

³ 'Histoire Naturelle des Oiseaux de l'Amerique Septentrionale.' 1807. *Muscicapa flava*, pl. 41.

the account of the habits of this hare, which I obtained from him and sent to you, as gospel. I have since that time discovered that he occasionally invents stories about animals in lack of true bills. So you may only believe what you please & think probable. He says that the catamounts skin was not to be found anywhere, and it seems that his black or silver foxes are cross foxes.

My friend Charles Churchill wrote to a gentleman in Burlington named Henry Loomis¹ who has been in the fur business, for information respecting foxes. He says that it would be impossible to procure one in Vermont in the flesh, but that it might be done through the Quebec agents of the Hudson's bay fur Co., or in Maine. It would cost a great deal however. He has paid from 9 to 35 dollars for skins. Mr. Thompson in his Gazetteer² of Vermont speaks of those in Mr. Loomis' possession. This gentleman refers to the copious accounts of the different foxes, martens &c. in Thompson's Gazetteer of Vermont, as well worthy of credit, as he contributed many of them from personal knowledge. He added one fact which Thompson has omitted, viz. with respect to the *Mustela Pennanti* it being a source of great injury to the Pine Marten Hunters.

One has been known to follow the line of traps for miles, partially eating the captured Martens, thereby damaging or entirely destroying the skins. They have a very disagreeable odor when improperly skinned, worse than that of the mink. They frequently spring the Marten traps, and then eat the bait, being to cunning to enter them before, so say the hunters. I have spoken and written to several other persons for various information which I will communicate as soon as it arrives. A friend is now in Erie Co. where I hope he will learn something. With my best respects to all your kind family, and congratulations to Victor³ I remain

Ever yours affectionately

Spencer F. Baird.

¹ A native of Burlington, Vt., born Aug. 31, 1818; died Dec. 18, 1886. Mr. Chas. E. Allen of Burlington, Vt., writes me that Mr. Loomis was a much respected citizen, entered into business before he was of age, and was an earnest and active promoter of the welfare of his native town, officiating as Trustee of the University of Vermont and President of the Burlington Savings Bank for thirty years. (R. D.)

² A Gazetteer of the State of Vermont, 1824, by Zadock Thompson, born May 23, 1796, died 1856.

³ Victor Gifford Audubon.

BAIRD TO AUDUBON.

Carlisle Feb. 26th, 1846.

My dear Mr. Audubon.

Coming through Harrisburg last Saturday on my way home after a three months absence, I heard that there was a "curious varmint" to be seen by the curious on payment of a "levy" in good money. I hastened thither and having with some effort fished out the coin from a collection of miscellanea existing in my breeches pocket, I tendered it, and, it on examination proving to be genuine, I was admitted to a sight of his highness. It proved to be a fine specimen of Pennant's Marten. It had been caught a few weeks ago, about ten miles above Harrisburg, in company with its mother who was despatched by the dogs, after making a most desperate resistance. The old one was said to have been about the size of a pointer dog. The young one is as large nearly as the *Lepus Americanus*. It is very savage, and emits a rather strong musky odor. It had been my intention to get it and send it on to you, but on inquiry, the price somewhat dampened my arder. Ten dollars was what the owners said that they had given for it, and they expected an additional sum to repay them for the trouble it had cost them. How are you off for these critters? & what shall be done about it.

Will you not be a little surprised, as I was, to hear of my having procured a fine adult specimen of *Lestris Pomarinus*,¹ shot a few years ago in summer or fall at Harrisburg. There is not the slightest question as to its having really been shot there, and in addition I am assured that their occurrence there is not rare. I was told some time ago of "gulls" of a dark color had been seen resting on the water with very long tails, but this I always set down as rather apocryphal. Facts and specimens however are stubborn things.

How do you come on with your figuring of new species of Birds. I have never yet been able to learn what your species procured last summer were.

¹ There is a specimen in the Baird collection at the Smithsonian Institution, Cat. No. 1275, labelled "Harrisburg, summer of 1839, Dr. John Fager." Dr. John Henry Fager was one of the first physicians of Harrisburg, Pa., and also much interested in birds and flowers, born May 31, 1805, died Aug. 18, 1872.

I have made drawings of the skulls of several of our quadrupeds which are at your service if you want them. They are Mink, Wild Cat, Ground Hog, *Lepus Sylvaticus*,¹ *Neotoma Floridana* and others. I have got a Camera Lucida now and intend trying to draw with it. Anything I can do in this way for you will be cheerfully done.

Yours Sincerely

Spencer F. Baird.

John J. Audubon Esq.
77 William St.
New York.

BAIRD TO AUDUBON.

Carlisle Nov. 4, 1846.

Dear Mr. Audubon

I have been intending to write for a long time, to find out how you all are at Minnie's Landing,² and how yourself is particularly, but have put it off from time to time for various reasons. I can do so no longer, but must beg you to let me know these particulars.

Since my last visit to you, two pretty important events have happened to me. The first was getting married,³ the second, settling down steadily in my Professional chair.⁴ My wife is the only daughter of Col. Churchill⁵ Inspector Gen. of the Army, now with Gen. Wool⁶ in Mexico. She suits me exactly, being as fond

¹ *Lepus floridanus mallurus* Thomas.

² "Minniesland," now known as Audubon Park, in the present limits of New York City. "The name came from the fact that my father and uncle always used the Scotch name 'Minnie' for mother. The land when bought was deeded to her, and always spoken of as Minnie's land." (See Audubon and his Journals, Vol. I, p. 71.)

³ The following is taken from a file of Carlisle, Pa., papers: "Married: Aug. 8, 1846, in Carlisle, by the Rev. John McClintock, Prof. Spencer F. Baird of Dickinson College, to Mary Helen Churchill, daughter of Col. S. Churchill, Inspector General U. S. Army."

⁴ "In 1845 he was chosen professor of natural history in Dickinson College, and in 1846, his duties and emoluments were increased by election to the chair of natural history and chemistry in the same institution." In 1846 there were about one hundred students in Dickinson College. There was under the immediate supervision of the college faculty a preparatory department or "Grammar School," as it was called, with about half that number of students.

⁵ Col. Sylvester Churchill, born about 1783, died Dec. 1862. Became Inspector General of the Army in 1841.

⁶ General John E. Wool, American General, born about 1789, died about 1869.

of birds & snakes & fishes etc. as myself. I have even given her a lesson or two in taxidermy.

My duties as professor consist in teaching Animal Physiology, Natural Theology & Mathematics. My salary is small \$400 but I hope will be larger hereafter. I have to work hard, but that is good for me.

Please to let me know how the quadrupeds get along. Is the first vol. published? How does John¹ get along in England? What became of his Texas birds?

Please to tell me the address of your friend Ayres.² I have been collecting fishes for some weeks, and wish to correspond & exchange with him on this subject. I can send him a good many species.

Please give my love to all your kind family. My wife (to whom two years ago I gave a picture of yourself, as the most acceptable present) sends hers also, and desires exceedingly to see one to whom her husband owes so many obligations of every kind. Believe me to be ever

Yours most affectionately

Spencer F. Baird.

AUDUBON TO BAIRD.

Minniesland.

Nov. 8th, 1846.

My dear Friend,

We were very happy to hear of your Success in obtaining a Professorship. I wish you had been more minute as to the amount of your Salary as I consider 400\$ as a very small sum. If you have not a house, fuel, and furniture, &c &c &c to compensate for so small a sum, and having so much to perform for it. We are all glad that you have a good helpmate in the shape of a wife, and we would be very glad to have you under our roof, even now; but as the winter is now fast approaching we hope to see you certainly some time next spring, or during the summer, as you know that then our place is worthy to reside at. The fishing is then Capital.

¹ John Woodhouse Audubon.

² W. O. Ayres, Sag Harbor, Long Island, N. Y., for whom Audubon named *Colaptes ayresii*, Birds of America, Vol. VII, 1843. *Colaptes hybridus* of Baird.

The residence of our Friend, W. O. Ayers, is on Long Island, and I think that a letter addressed to him at Sag-Harbor, will be sure to be received by that good Friend of ours.

He will be glad to receive the collection of fishes which you have procured for him, and I know will be most happy to exchange for other fishes or subjects if you should desire any at his hands. Please to give your Dear Lady our best love, and congratulations on her having such a capitally perfect husband. We are all well at present. I have not done anything with the Birds which, indeed, my son Victor has sent to the Academy of Philadelphia. I suppose I need not look any more for a Black Fox in the flesh from you during the next winter.

Consider me always my Dear Friend,

Your most sincerely attached,

John J. Audubon.

Should you procure a black fox, be sure to forward him uncut to our office New York 78 John Street. Adieu, and God bless both you and your Dear Wife.

This is a mistake, I brought them back. V. G. A.

The letter press ¹ will be ready in a few days. I will forward a Copy to you to Philada. from whence you can no doubt easily get it. I will join my Father, dear Mr. Baird, in congratulations, and in sincere wishes for your happiness & welfare.

Yours faithfully,

V. G. Audubon.

BAIRD TO VICTOR G. AUDUBON.

Carlisle Jan. 19, 1847.

My dear Victor

I have been trying for some time past to find time for writing and thanking you all for the copy of the Viviparous text. Never had mortal man such a feast as I in turning over the pages and reading the interesting and copious accounts of the habits of animals, many of which were unknown to me beyond the name. I was

¹ 'The Viviparous Quadrupeds of North America,' by John James Audubon and the Rev. John Bachman, D. D. &c. &c. Vol. I, Published by J. J. Audubon, 1846; Vols. II and III, published by V. G. Audubon, 1854.

exceedingly gratified by the kind terms I found myself mentioned throughout the book, more so than I deserve. Be assured that no effort of mine however humble shall be spared to assist in the perfecting a labor so stupendous and important as that in which you are engaged. Would that I could be of more substantial help by sending half a dozen subscribers, I may do so yet, who knows. I found it impossible to get for you a copy of the Berlin transactions containing the elucidations of Hernandez.¹ By the way the volume must be in the Library of the Lyceum, as if I remember aright, it was there I first saw it? If the book remain still unprocurable, I would advise you to import the volume, or the Physical part of the volume. Wiley and Putnam or Radde could do this in six or eight weeks at an expense of not more than about 2.00. I do not remember now whether the vol. was printed in 1827 or whether it contained the proceedings for 1827. In the latter case it could have been printed a year or two later. I have been looking over the Texan birds and find the curved bill Thrush-like bird, and the small spotted woodpecker undescribed, unless it may be in a paper by Cabot on Yucatan birds. It is very different from the bird described by Gambel as *Picus Nuttalli*² from California. I hope to get at them systematically in a few days and see what I can discover about them. I found the other day a dead specimen of a large shrew which seemed referable to *Sorex DeKayi*.³ I put it in spirits at your service. I have been making various skeletons & getting various books for the purpose of studying out the comparative anatomy of our animals. Anything that I may do or learn about American Quadrupeds will be at your service. All your queries respecting animals in your letter of the 26th shall be carefully attended to. I send you some extracts I made from the "Zoology of the Sulphur"⁴ a copy of which belonging to Dr. Wilson⁵ I found at the Academy. There are plates of

¹ Francisco Hernandez, a Spanish physician and naturalist, born Toledo, Spain, 1530, died Madrid, Spain, Jan. 28, 1587.

² *Dryobates nuttallii*.

³ *Blarina brevicauda* Say.

⁴ 'The Zoology of H. M. S. Sulphur,' under Capt. Sir Edward Belcher, during the years 1836-42. London, 1844.

⁵ Thomas Bellerby Wilson, one of the founders of the Philadelphia Academy of Natural Sciences in 1812. He presented the Academy with 12,000 books and pamphlets, and with his brother Edward, 26,000 specimens of birds. Born Jan. 17, 1807, died March 15, 1865.

most of the species. Gambel has a specimen of weasel which is intermediate between *Mustela frenata* Licht. and *M. xanthogenys* of Gray in the present extracts. Have you heard lately from John,¹ how does he get along, and when does he return. With my best respects to your father and whole family I remain

Yours as ever

Spencer F. Baird.

BAIRD TO AUDUBON.

Carlisle, Feb. 8, 1847.

My dear Mr. Audubon

Very much to my astonishment I received last Saturday a letter from Mr. Dana² saying that he had written to Dr. Pickering³ that I would make a good curator of the Smithsonian institute, and advising me if I wished the place to write immediately to Prof. Henry⁴ and enclose my credentials. Now I would like the situation amazingly and write to ask you to make out a flaming recommendation for the place & send me as soon as possible. Say what you please about qualification &c. I would be obliged to you for the exertion of any personal influence you may have on the board of Regents. When there I would hope to be materially useful to you in your labors. I do not think that I replied to your query whether Peale⁵ had published any of the quadrupeds of the exped. or in particular any deer. To the best of my knowledge he has not. Drawings of many species have been made, but nothing published. In an article by Count Castelnau⁶ on his South American travels in the *Comptes Rendus* Vol. 22. No. 23, June 1846, he says that there exists a remarkable difference between the young of the

¹ John Woodhouse Audubon, who was then in Europe with his family, devoting his time to painting pictures for the 'Quadrupeds.'

² James Dwight Dana, Geologist and Mineralogist. Born Feb. 12, 1813, died April 14, 1895.

³ Dr. Charles Pickering, Naturalist of the U. S. Exploring Expedition, under Capt. Charles Wilkes, in 1838-42. Born Nov. 10, 1805, died March 17, 1878.

⁴ Prof. Joseph Henry, elected first Secretary of the Smithsonian Institution Dec. 3, 1846. Born Dec. 17, 1799, died May 13, 1878.

⁵ Titian R. Peale. Accompanied several exploring expeditions as naturalist. Born 1800, died March 13, 1885.

⁶ Francis de Castelnau, who travelled extensively in South America. Born in London, England, 1812; died in Melbourne, Australia, 1880.

Cougar, *Felis concolor*, in North and South America, it being spotted in the former, and *unspotted* or uniform in the latter!! With my best respects to all your kind family Believe me

Yours affectionately

Spencer F. Baird.

BAIRD TO AUDUBON.

Carlisle April 24, 1847.

My dear Mr. Audubon

I received today from Perry County a fine specimen living of a Red Fox. If you want him let me know *immediately* and I will send him on *immediately*. As we have a station of the Phila. & Pittsburg telegraph in Carlisle you might send word by that means, & thus save several days. I hope to get some good quadrupeds this season as I have made extensive arrangements for gathering the small animals. I hope to spend our vacation this summer near Westport N. Y. at the lower end of Lake Champlain, with my wife's uncle Mr. Guy Hunter. He lives in the midst of an unbroken forest and beasts are abundant. I could get you a black fox, either in skin or possibly alive or freshly killed from there. Do you want one now? Weasels, Fishers &c. are plenty there. My wife and I expect to go up about the middle of July. Please present my best respects & love to your family.

Yours affectionately

S. F. Baird.

BIRDS OF TORONTO, CANADA.

BY JAMES H. FLEMING.

*Part II, Land Birds.*¹

114. **Colinus virginianus.** BOB-WHITE.—The Quail was at one time found along the north shore of Lake Ontario, certainly as far east as Port Hope (62 miles east of Toronto). Of this species the late Hon. G. W. Allen said, in 1853, "The Quail is still occasionally heard uttering its plaintive cry in autumn and winter, about our woods and fields. In former days large coveys used to remain in the stubble fields and about our barnyards, from October to March."² I doubt if any Quail of pure blood are left east of Lake Erie; those I have examined recently from Oakville (19 miles east of Toronto), are the descendents of imported birds and differ from the indigenous species.

115. **Bonasa umbellus togata.** CANADIAN RUFFED GROUSE.—Resident; formerly abundant, now not common; nest May 23, 1893. I have put our bird under this somewhat unsatisfactory form; the bird occurring north at least to Lake Nipissing is the same.

116. **Lagopus lagopus.** WILLOW PTARMIGAN.—A specimen taken May 15, 1897, about four miles from Whitby (29 miles east of Toronto), is in the collection of Mr. J. H. Ames;³ there is no question about the locality being authentic. An unusually southern migration of Willow Ptarmigan took place in the winter of 1896-97, and I recorded them as far south as Lake Nipissing.⁴ Dr. Wm. Brodie remembers a specimen that was taken many years ago in the township of Whitchurch. Ptarmigan are referred to as frequent migrants into the townships back of Darlington (about 40 miles east of Toronto).⁵

117. **Ectopistes migratorius.** PASSENGER PIGEON.—Once a regular summer resident, breeding in the country between Toronto and Lake Simcoe. The disappearance of the great flocks dates back at least forty years, and by 1880 the bird was rare here; the records for 1890 are May 12, adult male; September 20 and October 11, young females; earliest record, April 13, 1891, male; birds were seen on May 16 and July 6, 1900.⁶ These are the last and are reliable; there is no question that the Wild Pigeon is extinct in a wild state in America to-day.

¹ For Part I, Water Birds, see Vol. XXIII, Oct., 1905, pp. 437-453.

² Canadian Journal, 1853, I, 171.

³ Auk, XIV, 1897, 411.

⁴ Auk, XVIII, 1901, 37.

⁵ Early Settlers of Bowmanville, etc. J. T. Coleman, Bowmanville, 1875, 35.

⁶ Auk, XX, 1903, 66.

An item in one of the early Toronto papers, dated April 15, 1815, "Immense flights of the Wild Pigeon from west to east on the 27 ulto." is the earliest date of arrival I can find.

118. *Zenaidura macroura*. MOURNING DOVE.—Regular summer resident, never very common, May 16 to July 24; my data are insufficient but the dates of arrival and departure are probably April and October; nest June 3, 1899.

119. *Cathartes aura*. TURKEY VULTURE.—Accidental. One was killed in the township of Pickering (about 30 miles east of Toronto), in 1887.

120. *Circus hudsonius*. MARSH HAWK.—Regular summer resident, April 2 to October 21; earliest March 20, 1895, adult male; the young are abundant from September 1 to early October. A male taken May 28, 1895, is in changing plumage, very worn; latest record December 10, 1902. Breeds in Ashbridge's Bay.

121. *Accipiter velox*. SHARP-SHINNED HAWK.—Resident from September 1 to May 14, and probably through the year; young-birds September 4 to May 14; mature birds are not common, March 10 to October 7. Breeds very rarely. I have seen one set of eggs taken here.

122. *Accipiter cooperii*. COOPER'S HAWK.—Rare migrant; mature birds from August 10 to October 4; young bird September 24, 1895.

123. *Accipiter atricapillus*. AMERICAN GOSHAWK.—Regular fall migrant, October 2 to November 3; a few remain through the winter, leaving towards the end of March; earliest record August 24, 1899. Mature birds in full plumage were practically unknown till the great migration of 1896 when they became abundant, the young being almost entirely absent. The migration reached Toronto on October 26, and from then till December 20, very many birds were taken. I examined thirty-five local specimens, all in full plumage, and this was not by any means all that were taken. A few adults were noted the three following years, but none have been reported since December, 1899; the number of young birds since then has been normal.

124. *Buteo borealis*. RED-TAILED HAWK.—Common fall migrant; adults October 26 to November 20; young September 23 to November 29. I have no spring records, but have eggs said to be of this species taken here.

125. *Buteo borealis calurus*. WESTERN RED-TAIL.—One record, a male taken November 4, 1895, by Mr. J. Hughes Samuel.

126. *Buteo lineatus*. RED-SHOULDERED HAWK.—Resident; has not been common of recent years; adults from October 1 to May 22; nests from April 1 to 15.

127. *Buteo swainsoni*. SWAINSON'S HAWK.—Rare migrant; no records previous to 1890; a female taken May 22, 1894, is almost black; one taken September 5, 1890, is black, the breast mottled with buffy yellow. These are in my collection and I have seen two more local specimens.

128. **Buteo platypterus.** BROAD-WINGED HAWK.—Regular migrant; mature birds are rare, May 21 to June 30; young are abundant in the fall, August 23 to October 1.

129. **Archibuteo lagopus sancti-johannis.** AMERICAN ROUGH-LEGGED HAWK.—Regular winter migrant, sometimes abundant. An immense flight occurred in October, 1895; from the 26th to the 29th, the birds were taken in dozens; I must have had over fifty brought to me in that time. They were here in decreasing numbers till December 5; between these dates I examined seven in the black phase of plumage. A female taken August 25, 1894, is in changing plumage. A few birds remain through January and February; latest, March 12, 1902.

130. **Aquila chrysaëtos.** GOLDEN EAGLE.—Rare migrant; one taken October 24, 1896, one (a female) October 24, 1903, and one on December 15, 1904. There is but one record previous to 1896, but the species is resident in Frontenac County (north of the eastern end of Lake Ontario).

131. **Haliaeetus leucocephalus alascanus.** NORTHERN BALD EAGLE.—Migrant and rare winter resident, October 24 to April 6; young birds are not uncommon. A series of males is not available for measurement, but a series of females is given below.

Sex	Length	Extent	Wing	Tail	Cul- men	Dep. of Bill	Date	Locality
♀ ad.	× 34.75	× 88.25	× 24.50	11.90	2.80	1.45	Dec. 20, 1897	Dunchurch, Ont.
♀ juv.	× 34.25	× 83.	× 24.	12.20	2.45	1.35	Jan. —, 1890	" "
♀	× 33.	× 84.	× 23.	—	—	—	Mch. 23, 1893	"
♀ juv.	—	—	25.75	12.61	2.55	1.50	Mch. —, 1898	Loring, Ont.

Measurements in inches; × from fresh birds.

132. **Falco islandus.**¹ WHITE GYRFALCON.—A female taken November 20, 1905, is the only record; this is a fairly light bird, comparable with specimens from North Greenland. There appears to have been a southern migration of gyrfalcons in Western Europe and North America in 1905.

133. **Falco peregrinus anatum.** DUCK HAWK.—Regular fall migrant, not common; young birds from September 18 to October 20; mature birds are very rare, a female May 23, 1892, and a male September, 1902; a young male in Mr. Maughan's collection, taken June 25, 1894, is light ash color all over.

134. **Falco columbarius.** PIGEON HAWK.—Regular fall migrant, September 1 to December 6; not very common; mature birds are exceedingly rare. Given as a winter resident in 1853.²

135. **Falco sparverius.** AMERICAN SPARROW HAWK.—Summer resi-

¹ *Hierofalco candicans* (Gm.).

² Canadian Journal, I, 1852-3, 169.

dent, April 5 to October 1 (earliest February 10, 1904); common migrant; breeds (May 18, 1892).

136. **Pandion haliaëtus carolinensis.** AMERICAN OSPREY.— Regular migrant, fairly common May (May 10, 1902), and September 1 to 15, and probably later.

137. **Strix pratincola.** AMERICAN BARN OWL.— One record, a male taken September 7, 1899.¹

138. **Asio wilsonianus.** AMERICAN LONG-EARED OWL.— Common fall migrant, October 2 to November 7; rare summer resident; breeds (May 24, 1894).

139. **Asio accipitrinus.** SHORT-EARED OWL.— Regular migrant, March 5 to 15, and probably through April; abundant in the fall, October 3 to December 26, when large flocks sometimes occur. A light phase of plumage occurs very rarely.

140. **Syrnium varium.** BARRED OWL.— Regular winter resident, October 10 to March 19; sometimes abundant (October 1–10, 1902).

141. **Scotiaptex nebulosa.** GREAT GRAY OWL.— Winter migrant of irregular occurrence. The great flight that took place in the winter of 1889–90 is recorded by Mr. Wm. Cross. "I have received twenty-three specimens, and have had them reported from various parts of the Province. One of my acquaintances stationed at Barrie, received twenty-six this season. They began to come into this region in November, and increased in numbers up to February, after which they became very scarce again."² This is the largest flight recorded, but specimens have been taken in December, 1890, January, 1894, January and March, 1895, and January and February, 1896; the visits appear to have ceased after this.

142. **Cryptoglaux tengmalmi richardsoni.** RICHARDSON'S OWL.— Winter migrant, of irregular occurrence, November 3 to April 3; I have examined nine specimens since 1885, but the number taken probably averages one a year.

143. **Cryptoglaux acadica.** SAW-WHET OWL.— Regular winter resident, October 4 to March 3; probably resident, as I have a young bird taken May 15, 1889, and another young one taken in August. A large flight of these owls occurred in the fall of 1889, and in October (12 to 28), 1895.

144. **Otus asio.** SCREECH OWL.— Resident, not uncommon, sometimes abundant in October and November; breeds (April 27, 1890, five eggs, J. Jackson). The red phase of plumage is rare, usually occurring for several years in succession and then disappearing.

145. **Bubo virginianus.** GREAT HORNED OWL.— Winter resident, October 10 to March 30, usually common; a rare summer resident, a nest was taken in Vaughan Township March 25, 1889, and one at Scarboro, April 2, 1897.

¹ Auk, XVII, 1900, 177.

² Transactions of the Canadian Institute, I, 1889–90, 5.

The resident form in Southern Ontario is remarkably constant in color; the plumage is dark in tone, with comparatively little tawny or ochraceous; rufous birds are rare. Among those that visit us in winter there is an endless variation of color; one specimen is ashy gray.

146. **Bubo virginianus subarcticus.** ARCTIC HORNED OWL.—Of recent record here; there are none in old collections. I have examined four well marked birds since 1893; of these two were typical, the others rather more heavily marked, but none approached *occidentalis*, there being comparatively little ochraceous underlying the white.

147. **Bubo virginianus saturatus.** DUSKY HORNED OWL.—Among the horned owls taken here in winter are a few very dark birds, usually of large size and apparently referable to the form *heterocnemis* of Oberholser.

148. **Nyctea nyctea.** SNOWY OWL.—Regular migrant, October to January, sometimes abundant. The years of unusual abundance, as far as known, are 1833, '37, '39, '53, and '62;¹ in more recent times the years are 1884, '88, '89, '96, and 1901. The flight of 1901-02 extended from December to April; a few specimens were taken in May, and one on June 7.²

149. **Surnia ulula caparoch.** AMERICAN HAWK OWL.—Rare winter migrant of irregular occurrence, October 22 to January 10; I have the records of only three specimens since 1889, but there are several previous to this date.

150. **Coccyzus americanus.** YELLOW-BILLED CUCKOO.—Summer resident, not very common, May 28 to August 23; latest date September 21, 1906 (J. H. Ames); breeds (July 1, 1891). This cuckoo was regarded as very rare here till 1889.

151. **Coccyzus erythrophthalmus.** BLACK-BILLED CUCKOO.—Regular summer resident, not uncommon May 15 to August 30; breeds (June 2 and August 12, 1889; July 6 and 20, 1895). Mr. Geo. E. Atkinson records the finding of eggs of this cuckoo in nests of the Wood Pewee and Yellow Warbler at Toronto³ and Dr. C. K. Clarke records several instances of the same thing at Elora, Ont.⁴

152. **Ceryle alcyon.** BELTED KINGFISHER.—Summer resident, common April 1 to October 10; earliest record March 6, 1894 (J. Hughes Samuel); breeds.

153. **Dryobates villosus.** HAIRY WOODPECKER.—Common migrant and rather rare winter resident; my records are all between October 11 and April 4, and it does not appear to breed here. This form is the one occurring in southern Ontario, at least south of Lake Nipissing, and I have not found *leucomelas*.

154. **Dryobates pubescens medianus.** DOWNY WOODPECKER.—Resident; breeds; an abundant migrant.

¹ Canadian Journal, VII, 1862, 53.

² Auk, XIX, 1902, 281, 400.

³ Transactions Canadian Institute, 1891-92, 45.

⁴ *Ibid.*, 1889-90, 9-11.

155. **Picoides arcticus.** ARCTIC THREE-TOED WOODPECKER.—Accidental winter migrant, first recorded in 1893 (October 21 and December 4); other records are October 19, 1896, and November 1 and 4, 1899.

156. **Picoides americanus.** AMERICAN THREE-TOED WOODPECKER.—One record, a male in my collection taken November 16, 1901.¹

157. **Sphyrapicus varius.** YELLOW-BELLIED WOODPECKER.—Abundant migrant, April 8 to May 13, and September 11 to 28; latest records October 7 to 14, 1906. A rather rare summer resident, breeds.

158. **Ceophloeus pileatus abieticola.** NORTHERN PILEATED WOODPECKER.—Said to have been formerly a resident. I have seen specimens taken within twenty or thirty miles of Toronto some years ago, and I recently saw fresh workings of this woodpecker thirty-five miles from the city, near Georgetown.

159. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.—Common summer resident, April 19 to August 29; breeds. One winter record (January 28, 1905). This woodpecker was scarce during the summer of 1906.

160. **Centurus carolinus.** RED-BELLIED WOODPECKER.—Accidental migrant. I have examined four specimens, a female, May 19, 1885,² a male, May 24, 1890, in Mr. Maughan's collection, and two taken November 27, 1899.

161. **Colaptes auratus luteus.** NORTHERN FLICKER.—Summer resident, common, April 7 to October 24; breeds in all suitable places. Rare winter resident (January 28, 1905; February 3, 1906). Two of the so-called hybrid flickers have been taken here; one is in the collection of Mr. Ernest Seton,³ the other is in the collection of Mr. Geo. E. Atkinson.

162. **Antrostomus vociferus.** WHIP-POOR-WILL.—Regular migrant; rather rare summer resident, April 14 to October 10; breeds (May 21, 1888).

163. **Chordeiles virginianus.** NIGHTHAWK.—Common summer resident, May 1 to September 9; latest dates September 30, 1889, and October 11, 1906 (H. H. Mitchell). Large flocks appear in the fall for a day or two (August 28, 1904, and September 8, 1892). Breeds (June 28, 1892).

164. **Chætura pelagica.** CHIMNEY SWIFT.—Common summer resident, April 27 to August 31; earliest April 18, 1891; breeds (June 7, 1892).

165. **Trochilus colubris.** RUBY-THROATED HUMMINGBIRD.—Common summer resident, May 4 to September 14; earliest record April 12, 1890; latest September 22, 1906; usually abundant August 15 to 31; breeds (June 1, 1904).

166. **Tyrannus tyrannus.** KINGBIRD.—Common summer resident, May 11 to August 27; latest record September 15, 1900 (C. W. Nash); breeds (June 11, 1892).

167. **Myiarchus crinitus.** CRESTED FLYCATCHER.—Regular migrant and rare summer resident, May 4 to September 27; breeds (June 22, 1892).

¹ Auk, XIX, 1902, 79.

² Auk, II, 1885, 335.

³ *Ibid.*

168. *Sayornis phœbe*. PHOEBE.—Common summer resident, April 2 to October 22; breeds.

169. *Nuttallornis borealis*. OLIVE-SIDED FLYCATCHER.—Rare spring migrant, May 18 to June 3; earliest May 10, 1900 (J. Hughes Samuel); one was shot on August 9, 1899, by Mr. John Bunker.

170. *Horizopus virens*. WOOD PEWEE.—Summer resident, fairly common, April 3 to September 26; breeds (June 14, 1902, July 1, 1892).

171. *Empidonax flaviventris*. YELLOW-BELLIED FLYCATCHER.—Regular migrant, usually not very common, May 20 to 31; latest spring record June 15, 1894; earliest fall record July 27, 1893; usually from August 14 to 25.

172. *Empidonax traillii alnorum*. ALDER FLYCATCHER.—Rare spring migrant, May 13 to June 5; earliest spring record April 18, 1906; one seen September 22, 1906.

173. *Empidonax minimus*. LEAST FLYCATCHER.—Common migrant, May 9 to 24 (May 13 to 29, 1906), August 13 to 27; breeds (June 6, 1897, Carleton West).

174. *Otocoris alpestris*. HORNED LARK.—This was the original form here and probably bred as late as 1886. I have examined three specimens taken since then, two in 1889 (September 28 and October 12), and one taken October 24, 1891, which is the last record.

175. *Otocoris alpestris praticola*. PRAIRIE HORNED LARK.—Common resident, February 2 to October 22; breeds commonly, April 10 to June 15. This form is a comparatively recent arrival; Mellwraith gives the date at Hamilton as between 1871 and 1873; ¹ *hoyti* has not been found here.

176. *Cyanocitta cristata*. BLUE JAY.—Resident, sometimes abundant; rather rare breeder; nest May 15, 1892.

177. *Perisoreus canadensis*. CANADA JAY.—In the winter of 1839-40 a considerable migration of this jay occurred at Toronto, and is recorded by the late Hon. G. W. Allen.² This is the migration referred to by Mr. Ernest Seton³ on the authority of the Rev. John Doel as occurring in the winter of 1836-37. Mr. Doel says, "the bird was previously unknown in the district and has not since been observed." Specimens from this migration are in my collection. There are no further records till October, 1904, when another migration visited southern Ontario and a number of birds were taken at Toronto and other points on Lake Ontario. I have given a full account of this elsewhere.⁴

178. *Corvus corax principalis*. NORTHERN RAVEN.—At one time abundant along the north shore of Lake Ontario, but they disappeared at a very early date. A letter written at Port Hope (62 miles east of

¹ Nuttall Bulletin, VIII, 1883, 143.

² Canadian Journal, I, 1852-53, 167-72.

³ Auk, II, 1885, 335.

⁴ Ontario Natural Science Bulletin, I, 1905, 11, 12.

Toronto) in 1820 mentions "ravens and rooks" as occurring there then; the Rev. John Doel tells me the last pair killed was in the Queen's Park about 1848.

179. **Corvus brachyrhynchos.** AMERICAN CROW.—Abundant resident except in winter; they usually disappear in November and reappear early in February, a few only remaining through the winter. Breeds (April 16 to May 24).

180. **Dolichonyx oryzivorus.** BOBOLINK.—Summer resident, April 19 to September 8; breeds (June 1, 1899).

181. **Molothrus ater.** COWBIRD.—Abundant summer resident, April 2 to early in October; rare winter resident, January 14 to March 29.

182. **Xanthocephalus xanthocephalus.** YELLOW-HEADED BLACKBIRD.—Accidental; one record, a male taken about 1885; this bird is now in my collection.¹

182. **Agelaius phoeniceus.** RED-WINGED BLACKBIRD.—Abundant summer resident, March 8 to November 10; latest record December 25, 1890; breeds (May 31 to June 25).

183. **Sturnella magna.** MEADOWLARK.—Common summer resident, March 16 to October 30; numerous winter records; breeds (May 2 to July 1).

184. **Icterus spurius.** ORCHARD ORIOLE.—Possibly a very rare summer resident; there are about a dozen records, distributed over a long period of years, nearly all in May; Mr. J. Hughes Samuel took an immature male May 20, 1900, and on July 5, observed a pair breeding at Island Park.

185. **Icterus galbula.** BALTIMORE ORIOLE.—Common summer resident, April 12 to September 1; breeds (June 14, 1889).

186. **Euphagus carolinus.** RUSTY BLACKBIRD.—Abundant migrant, April 6 to May 8, and September 9 to October 27.

187. **Quiscalus quiscula æneus.** BRONZED GRACKLE.—Abundant summer resident, March 20 to November 3; earliest record February 26, 1906; a common breeder; said to be a rare winter resident (January, 1906).

188. **Hesperiphona vespertina.** EVENING GROSBEAK.—Winter migrant of irregular occurrence. A flight in the winter of 1854-55 in southern Ontario is the earliest recorded; birds were taken at Toronto on December 25,² at Hamilton in the following April,³ and at Woodstock on May 7, 1855.⁴ Other small flights are recorded elsewhere,⁵ but the great flight was in the winter of 1889-90; the first birds were recorded at Toronto on January 18, and the last on May 26; a very full report was published at the time by a committee of ornithologists;⁶ they had information of 453

¹ Auk, II, 1885, 334.

² Auk, II, 1885, 334.

³ Transactions Canadian Institute, III, 1891-92, 88.

⁴ Canadian Journal, III, 1854-55, 287.

⁵ Transactions Canadian Institute, III, 1891-92, 88; Nuttall Bulletin, VIII, 1883, 146; Auk, IV, 1887, 256; Auk, V, 1888, 208.

⁶ Transactions Canadian Institute, III, 1891-92, 76-89.

specimens in the hands of individuals, and estimated that not less than 1000 grosbeaks were slaughtered. Specimens have been taken since then, in March, 1897 and in January and March, 1902.

189. ***Pinicola enucleator leucura***. PINE GROSBK.—Irregular winter migrant, sometimes abundant, usually from December to March. A supposed hybrid of this species, taken January 22, 1890, is in the collection of Mr. Ernest Seton, and has been fully described and figured by him.¹

190. ***Carpodacus purpureus***. PURPLE FINCH.—Resident, sometimes abundant in winter; not common in summer; breeds (July 13, 1895).

191. ***Loxia curvirostra minor***. AMERICAN CROSSBILL.—Irregular winter resident, sometimes abundant, December 25 to May 3. In 1892 crossbills were here from March 30 to May 5, and I took one on July 17, and saw another on the 18th, these latter were attracted by caged birds; a male taken April 14, 1894, is in juvenile plumage.

192. ***Loxia leucoptera***. WHITE-WINGED CROSSBILL.—Irregular winter resident, never very common, January 4 to April 14.

193. ***Acanthis hornemannii exilipes***. HOARY REDPOLL.—Rare winter migrant. A flock of redpolls that was about East Toronto from February 10 to March 23, 1896, seemed to have consisted altogether of this species. I examined in all nine specimens from this flock; no more were taken till January 8, 1904, when I found one that had been taken from a flock of *linaria*.

194. ***Acanthis linaria***. REDPOLL.—Irregular winter resident, sometimes abundant from November to March.

195. ***Acanthis linaria holbœllii***. HOLBÖLL'S REDPOLL.—Three specimens are recorded by Mr. Ernest Seton, taken at Lorne Park, a few miles west of Toronto — a male taken March 3, and a male and female March 15, 1888. These were determined by Mr. Robert Ridgway, who said they were not typical of the form but nearer to that than to *linaria*.² I can find no local specimens comparable with these three birds; one of the females, now in my collection, agrees exactly with a breeding female, presumably of this species, from St. Matthew's Mission, Peel River, Mackenzie Territory.

196. ***Acanthis linaria rostrata***. GREATER REDPOLL.—Occurs among flocks of *linaria*, but is rare; I have seen about a dozen well marked local specimens taken between November 9 and February 10.

197. ***Carduelis carduelis***. EUROPEAN GOLDFINCH.—“A male European Goldfinch was collected May 21, 1887, by Mr. Daniel S. Cox, about a mile north of the city limits — one out of four — while resting on the top of a beech tree. The remaining three flew off in a northerly direction. The birds were evidently in a natural condition and doubtless from the New York colony.” (William Brodie.³)

¹ Auk, XI, 1894, 1-3.

² Transactions Canadian Institute, III, 1891-92, 29.

³ Auk, V, 1888, 211.

198. **Astragalinus tristis.** AMERICAN GOLDFINCH.—Resident; abundant in summer and sometimes in winter, though I do not think the same birds are resident in summer and winter; breeds (July 23–30, 1893).

199. **Spinus pinus.** PINE FINCH.—Irregular winter resident, sometimes abundant October 2 to March 23. Siskins bred in Wellington County, at Guelph and Mount Forest, in April and May, 1905.¹

200. **Passer domesticus.** HOUSE SPARROW.—The "Avian Rat," of Tegetmeier, was introduced about 1870, it increases and decreases according to the severity of the winter, but on the whole is still on the increase.

201. **Passerina nivalis.** SNOWFLAKE.—Winter migrant, usually abundant, October 10 to March 15.

202. **Calcarius lapponicus.**—LAPLAND LONGSPUR.—Irregular winter resident October 10 to April 23; latest May 17, 1891; not common, usually found singly with flocks of Snowflakes, but Mr. Nash has recorded flocks October 10–26, 1891.²

203. **Poecetes gramineus.** VESPER SPARROW.—Abundant summer resident, April 7 to October 23; breeds commonly.

204. **Passerculus sandwichensis savanna.** SAVANNA SPARROW.—Common summer resident, April 5 to October 16; breeds (May 31 to June 23).

205. **Coturniculus savannarum passerinus.** GRASSHOPPER SPARROW.—Two records—one taken on Toronto Island by Dr. Brodie, the other by Mr. John Edmonds May 24, 1890, at Ashbridges Bay; both are still in the collection of the Biological Society.

206. **Ammodramus lecontei.** LECONTE'S SPARROW.—One specimen taken by Mr. George Pierce May 5, 1897, is in the collection of Mr. J. H. Ames.³

207. **Ammodramus nelsoni.** NELSON'S SPARROW.—Rare migrant, two taken September 22, 1894, and a female, the only spring record, June 10, 1895, by Mr. Nash, are in my collection; these were examined by Dr. J. Dwight, Jr., who said they were not typical but nearer *nelsoni* than *subvirgatus*. I have seen in all eleven local specimens; latest date October 28, 1896.⁴

208. **Chondestes grammacus.** LARK SPARROW.—Summer resident, rare and very local; earliest record May 3, 1895; there are no fall records; breeds (May 15, 1899; July 1, 1898).

209. **Zonotrichia leucophrys.** WHITE-CROWNED SPARROW.—Regular migrant, common April 15 to May 24; September 27 to October 10; latest record October 19, 1906.

210. **Zonotrichia albicollis.** WHITE-THROATED SPARROW.—Common

¹ Auk, XXII, 1905, 415; Ontario Natural Science Bulletin, II, 1906, 1718.

² Biological Review of Ontario, I, 1894, 30.

³ Auk, XIV, 1897, 411.

⁴ Auk, XVI, 1899, 277.

migrant, April 8 to May 16, and August 28 to October 22; probably breeds; males were heard singing June 6 to July 7, 1906, at several places outside the city.

211. *Spizella monticola*. TREE SPARROW.— Winter resident, sometimes abundant, October 10 to April 17; the majority leave in November and do not return till April.

212. *Spizella socialis*. CHIPPING SPARROW.— Summer resident, abundant April 5 to October 3; earliest, March 16; one of our most common breeders.

213. *Spizella pusilla*. FIELD SPARROW.— Summer resident, sometimes abundant, April 16 to October 14; earliest record April 4, 1890; breeds (May 23 to June 5).

214. *Junco hyemalis*. SLATE-COLORED JUNCO.— Abundant migrant, April 2 to May 20, and September 24 to October 22, and irregular winter resident, December 12 to March 20; breeds rarely (May 24, 1887; July 19, 1892).

215. *Melospiza cinerea melodia*. SONG SPARROW.— Abundant summer resident, March 15 to October 26; a rare and irregular winter resident (December 11, January 31, February 21); one of our most common breeders (May 12 to August 13).

216. *Melospiza lincolni*. LINCOLN'S SPARROW.— Regular spring migrant, May 6 to 26; generally distributed, never common. Mr. J. Hughes Samuel saw three at Island Park September 15, 1900, and I saw one at the same place September 23, 1906.

217. *Melospiza georgiana*. SWAMP SPARROW.— Regular summer resident, common April 14 to October 7; breeds.

218. *Passerella iliaca*. FOX SPARROW.— Regular migrant, local, and usually not common, April 5 to 29, and October 2 to 26. Mr. George E. Atkinson has published a very full account of this sparrow in Toronto.¹

219. *Pipilo erythrophthalmus*. TOWHEE.— Summer resident, fairly common April 13 to October 19; common migrant; latest record November 16, 1899; breeds (May 25, 1890).

220. *Cardinalis cardinalis*. CARDINAL.— Accidental and probably occurs only in winter; there are several local records but two only have dates, a female taken in February, 1900, and a male seen in November, 1902.

221. *Zamelodia ludoviciana*. ROSE-BREASTED GROSBEEK.— Regular spring migrant, fairly common May 10 to 23; Mr. Nash gives fall records from July 13 to the middle of August, and I took a young male on September 10, 1906.

222. *Cyanospiza cyanea*. INDIGO BUNTING.— Regular, though not very common, summer resident, May 18 to August 4, and probably later; breeds.

223. *Piranga erythromelas*. SCARLET TANAGER.— Regular migrant, sometimes common, May 12 to 30, and September 15 to October 13. In

¹ Biological Review of Ontario, I, 1894, 57-63.

May, 1888, a very large number of these birds appeared in the city and attracted much attention.

224. *Piranga rubra*. SUMMER TANAGER.—“One specimen taken at Scarboro Heights, near Toronto, by Mr. Herring, in May 1890.”¹ This specimen is now in the museum of the Geological Survey at Ottawa.

225. *Progne subis*. PURPLE MARTIN.—Regular summer resident, local and decreasing, April 18 to August 25; breeds (June 7, 1890).

226. *Petrochelidon lunifrons*. CLIFF SWALLOW.—Regular summer resident, usually from early in May to the middle of August; earliest record April 23, 1890, latest September 8, 1906; breeds locally and is not by any means as common as it was.

227. *Hirundo erythrogastra*. BARN SWALLOW.—Regular summer resident, common April 20 to August 30; earliest record April 8, 1890; breeds (June 25, 1892).

228. *Iridoprocne bicolor*. TREE SWALLOW.—Regular summer resident, common April 8 to September 13; earliest record March 31, 1897; latest fall record October 20, 1906 (H. H. Mitchell); breeds (June 7, 1890).

229. *Riparia riparia*. BANK SWALLOW.—Regular summer resident, common April 19 to September 13; earliest record April 4, 1890, latest October 9, 1886; breeds (June 2, 1892).

230. *Stelgidopteryx serripennis*. ROUGH-WINGED SWALLOW.—Probably a rare summer resident; a male was taken May 16, 1900, and on June 12, 1906, I found a pair building in an old kingfisher's tunnel and took the female.

231. *Ampelis garrulus*. BOHEMIAN WAXWING.—An irregular winter resident, rare. A flight occurred in 1895 when several small flocks spent a month or more in the residential parts of the city. Mr. Geo. E. Atkinson recorded their arrival on February 3; they were absent from the 13th to the 22d, and were last seen on March 6; Mr. Nash took one at East Toronto on the 22d.

232. *Ampelis cedrorum*. CEDAR WAXWING.—Resident, irregular in winter; breeds (June 20, 1898).

233. *Lanius borealis*. NORTHERN SHRIKE.—Regular winter resident, not very common October 12 to March 22; earliest October 3, 1896; latest April 11, 1898; I took a nest on May 28, 1887, but this is the only record.

234. *Lanius ludovicianus migrans*. MIGRANT SHRIKE.—Regular summer resident, not very common, April 3 to the end of August; earliest record March 23, 1897. This shrike was not originally found here; it was not represented in the Allen collection formed in 1854-55, nor is it mentioned in a list of birds published in 1858,² and McIlwraith says it was first observed at Hamilton in April, 1860;³ breeds.

¹ Macoun, Catalogue of Canadian Birds, 537.

² Hand Book of Toronto, 1858. The list of Toronto birds, pp. 37-56, is not of much value, and is said to have been written by Dr. S. P. May.

³ Canadian Journal, V, 1860, 392.

235. **Vireo olivaceus.** RED-EYED VIREO.—Regular summer resident, common May 12 to October 10; earliest record May 6, 1889; breeds commonly.

236. **Vireo philadelphicus.** PHILADELPHIA VIREO.—Regular migrant, not very common, May 18 to 27, and September 10 to 22.

237. **Vireo gilvus.** WARBLING VIREO.—Regular migrant, not common, May 11 to 24, and September 5 to 24; Mr. J. Hughes Samuel noted this vireo as abundant May 17, 1900.

238. **Vireo flavifrons.** YELLOW-THROATED VIREO.—Regular migrant, rare, May 2 to June 13, and July 6 to the end of August. This and the two preceding species may eventually be found breeding here.

239. **Vireo solitarius.** BLUE-HEADED VIREO.—Regular migrant, common May 10 to 20, and September 17 to October 22.

240. **Mniotilta varia.** BLACK AND WHITE WARBLER.—Abundant migrant, April 25 to May 24, and August 28 to September 26; rare summer resident, breeds.

241. **Helminthophila rubricapilla.** NASHVILLE WARBLER.—Abundant migrant, May 1 to 24, and September 4 to 26. A male was taken June 6, 1891, and a female June 14, 1895.

242. **Helminthophila celata.** ORANGE-CROWNED WARBLER.—Regular migrant, rare, May 7 to 15 and probably later (May 27, 1888, Hamilton, Ont.); in the fall, October 6 to 10. I have the records of only eight in eight years.

243. **Helminthophila peregrina.** TENNESSEE WARBLER.—Regular migrant, rare, May 13 to 22, and September 23 to October 24 (September 5, 1885, Hamilton, Ont.). First taken here in 1886; the records in the 'Proceedings' of the Canadian Institute, 1890-92, refer to the female of the Black-throated Blue Warbler.

244. **Compsothlypis americana usneæ.** NORTHERN PARULA WARBLER.—Abundant migrant May 5 to 29, and September 2 to 29; latest spring record June 3, 1897; latest fall record October 14, 1906.

245. **Dendroica tigrina.** CAPE MAY WARBLER.—Regular migrant, sometimes not uncommon, May 8 to 19, and September 5 to 11; latest spring records May 24, 1890, and May 29, 1906. Formerly one of our rarest warblers; there were not more than four records between 1889 and 1897. Mr. J. Hughes Samuel considers the increase began in 1898, and in 1900 I found them not uncommon in the city.

246. **Dendroica æstiva.** YELLOW WARBLER.—Regular summer resident, abundant May 2 to July 19 (May 4 to September 9, 1906); earliest spring record April 18, 1899; latest fall record September 16, 1899 (J. Hughes Samuel); breeds abundantly (May 23 to June 12).

247. **Dendroica cærulescens.** BLACK-THROATED BLUE WARBLER.—Regular migrant, abundant May 8 to 24, and August 28 to September 29; earliest spring record May 2, 1900; latest fall record October 5, 1895 (J. Hughes Samuel).

248. **Dendroica coronata.** MYRTLE WARBLER.—Regular migrant,

April 29 to May 22, and September 11 to October 22; earliest spring record April 25, 1896 (J. Hughes Samuel). I have never found this warbler common in spring but it is always abundant in the fall.

249. *Dendroica maculosa*. MAGNOLIA WARBLER.—Regular migrant, abundant May 8 to 24, and September 8 to 26; earliest spring record April 15, 1890 (Geo. E. Atkinson); latest, June 1, 1900 (J. Hughes Samuel); earliest fall record August 27, 1900 (J. Hughes Samuel); latest, October 14, 1906.

250. *Dendroica cerulea*. CERULEAN WARBLER.—Rare spring migrant. I have the records of three males, May 24, 1890, May 20, 1893, and May 11, 1897; besides these there are four or five other local specimens, including a pair in the museum of Toronto University, taken in 1856.

251. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.—Abundant migrant, May 3 to 29, and August 19 to September 28; rare summer resident; probably breeds.

252. *Dendroica castanea*. BAY-BREASTED WARBLER.—Regular spring migrant, not very common, May 10 to 24; latest spring record May 30, 1906; one fall record, a young female, August 24, 1906.

253. *Dendroica striata*. BLACK-POLL WARBLER.—Regular migrant, not very common, May 17 to June 3, and August 27 to September 28.

254. *Dendroica blackburniæ*. BLACKBURNIAN WARBLER.—Regular migrant, common May 3 to 28, and August 4 to 24; latest fall record September 23, 1906. This was a rare warbler twenty years ago.

255. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.—Abundant migrant, April 28 to May 28, and August 29 to October 12.

256. *Dendroica kirtlandii*. KIRTLAND'S WARBLER.—Accidental; one record, a male taken May 16, 1900, by Mr. J. Hughes Samuel.¹

257. *Dendroica vigorsii*. PINE WARBLER.—Regular migrant, not common, April 20 to May 17, and August 28 to September 7; earliest spring record April 15, 1890, latest May 26, 1894 (J. Hughes Samuel).

258. *Dendroica palmarum*. PALM WARBLER.—Regular migrant, not very common, May 4 to 20, and September 13 to October 10; earliest fall record September 9, 1906. Hamilton records are earlier, April 27, 1891; September 1, 1886.

259. *Dendroica discolor*. PRAIRIE WARBLER.—Two records, May 10 and 11, 1900, both males, the first taken by Mr. J. Hughes Samuel,¹ the other by Mr. J. H. Ames.²

260. *Seiurus aurocapillus*. OVEN-BIRD.—Abundant migrant, May 4 to 20; September 10 to 21; rare summer resident; breeds.

261. *Seiurus noveboracensis*. WATER-THRUSH.—Regular migrant, not very common, May 4 to 17, and August 8 to September 15; possibly a rare summer resident.

262. *Seiurus motacilla*. LOUISIANA WATER-THRUSH.—Two records,

¹ Auk, XVII, 1900, 391.

² Auk, XVIII, 1901, 106.

a female taken by Mr. Ernest Seton, August 23, 1888, on the Credit River (13 miles east of Toronto), the other a female taken by Mr. C. W. Nash at Kew Beach, East Toronto, May 8, 1900. This species appears to be a local though regular migrant at Hamilton.

263. *Geothlypis agilis*. CONNECTICUT WARBLER.—Regular migrant, not common, May 23 to 30, and August 26 to September 12. This was considered one of our rarest warblers till about 1896 when Mr. J. Hughes Samuel found them not uncommon in May at Island Park.

264. *Geothlypis philadelphia*. MOURNING WARBLER.—Regular migrant, not uncommon, May 11 to 30, and August 15 to 26; rare summer resident; breeds. Mr. C. W. Nash took a young bird from the nest, July 1, 1893; Mr. J. Hughes Samuel saw adults with young, July 30, 1895. This is another species that was rare up to a few years ago.

265. *Geothlypis trichas brachidactyla*. NORTHERN YELLOW-THROAT.—Regular migrant, common May 8 to 31, and August 31 to October 6; latest fall record October 19, 1904; rare summer resident (June 6, 1905).

266. *Wilsonia pusilla*. WILSON'S WARBLER.—Regular migrant, common May 11 to 27, and August 26 to September 27.

267. *Wilsonia canadensis*. CANADIAN WARBLER.—Regular migrant, common May 10 to June 1, and August 19 to September 27; possibly a rare summer resident.

268. *Setophaga ruticilla*. AMERICAN REDSTART.—Abundant migrant, May 8 to 24, and August 24 to September 24; common summer resident, May 18 to about August 16; breeds (June 1 to 15).

269. *Anthus pensilvanicus*. AMERICAN PIPIT.—Regular migrant, not common in the spring, May 4 to 10 (May 20 at Hamilton); abundant in the fall, September 14 to November 24.

270. *Galeoscoptes carolinensis*. CATBIRD.—Regular summer resident, common May 4 to September 26; earliest spring record, May 1, 1899; latest, October 15, 1906; breeds commonly.

271. *Toxostoma rufum*. BROWN THRASHER.—Regular summer resident, fairly common, April 21 to September 25; breeds.

272. *Troglodytes aëdon*. HOUSE WREN.—Common migrant and fairly common summer resident, April 21 to October 13; earliest spring record, April 15, 1890; breeds.

273. *Olbiorchilus hiemalis*. WINTER WREN.—Common migrant, April 14 to May 7, and September 10 to October 26; latest fall record November 12, 1895; rare winter resident (January 18, 1892; March 17, 1894); very rare summer resident, breeds (June 2, 1894, W. Raine).

274. *Cistothorus stellaris*. SHORT-BILLED MARSH WREN.—Two records, a female August 29, 1891, and a male June 7, 1895, both taken by Mr. C. W. Nash.¹

275. *Telmatodytes palustris*. LONG-BILLED MARSH WREN.—Common summer resident, April 14 to October 18; breeds (June 5 to July 28).

¹ Auk, XIII, 1896, 347.

276. *Certhia familiaris americana*. BROWN CREEPER.—Common migrant, April 4 to May 24, and September 27 to October 15; irregular winter resident, December 15 to March 8; possibly a rare summer resident.

277. *Sitta carolinensis*. WHITE-BREASTED NUTHATCH.—Winter and fall resident, September 16 to March 16; no summer records except from July 10 to 21, 1892.

278. *Sitta canadensis*. RED-BREASTED NUTHATCH.—Resident between September 2 and May 13, usually leaving about April 5.

279. *Parus atricapillus*. BLACK-CAPPED CHICKADEE.—Common resident, breeds.

280. *Parus hudsonicus*. HUDSONIAN CHICKADEE.—One record, Richmond Hill (13 miles north of Toronto), about 1890.

281. *Regulus satrapa*. GOLDEN-CROWNED KINGLET.—Abundant migrant, April 2 to May 12, and October 6 to 27; irregular winter resident (January 16, 1899, February 3, and April 21, 1894).

282. *Regulus calendula*. RUBY-CROWNED KINGLET.—Abundant migrant, April 20 to May 11, and October 5 to 20; earliest spring record April 4, 1890, latest May 22, 1894; latest fall record November 3, 1907.

283. *Poliophtila cærulea*. BLUE-GRAY GNATCATCHER.—Three records, a male May 9, 1885, in Mr. Ernest Seton's collection;¹ a female taken May 5, 1891, by Mr. O. Spanner;² and a female taken May 10, 1900, by Mr. C. W. Nash.

284. *Hylocichla mustelina*. WOOD THRUSH.—Regular migrant, May 4 to 20; I can find only one fall record, a female taken September 7, 1891; rare summer resident, breeds (May 4, 1890; June 3, 1894; June 22, 1895).

285. *Hylocichla fuscescens*. WILSON'S THRUSH.—Abundant migrant, April 13 to May 16, and September 13 to 26; common resident, May 16 to August 31; breeds (May 29 to June 26).

286. *Hylocichla aliciae*. GRAY-CHEEKED THRUSH.—Regular migrant, rare in spring, May 21 to 27 (May 15 to 29, 1906); not uncommon in fall, September 10 to October 18.

287. *Hylocichla ustulata swainsonii*. OLIVE-BACKED THRUSH.—Common migrant, April 27 to May 26, and September 12 to October 14; earliest spring record, April 13, 1890; earliest fall record, September 1, 1906.

288. *Hylocichla guttata pallasii*. HERMIT THRUSH.—Abundant migrant, April 13 to May 10, and September 23 to October 23; earliest spring record, April 8, 1898; earliest fall record, September 19, 1906; there are several late records (November 20, 1901), and Dr. K. C. McIlwraith observed one from November 21, 1903, to the following January.

289. *Merula migratoria*. ROBIN.—Abundant summer resident, March 24 to October 24, earliest spring record, February 22, 1906; irregular winter resident, January 1 to February 9; breeds abundantly.

¹ Auk, II, 1885, 334.

² Transactions of the Canadian Institute, 1891-92, 73.

290. ***Sialia sialis***. BLUEBIRD.—Abundant migrant and summer resident, March 3 to November 11; earliest spring record, February 26, 1906.

HYPOTHETICAL LIST.

18. ***Rallus crepitans***. CLAPPER RAIL.—Given in Prof. Hincks's list, and a pair were sent to Paris; given as occurring at Toronto, in 'Hand Book of Toronto,' 1858, 54, and by McIlwraith in his Hamilton list of 1860,¹ but is not mentioned in subsequent lists. In all three cases *R. elegans* is given as well, but even with this evidence the records must be incorrect.

19. ***Canachites canadensis canace***. CANADIAN SPRUCE GROUSE.—Of this species the late Hon. G. W. Allen says: "I hardly know whether I am correct in enumerating the Spruce Partridge as among the number of birds found in the immediate neighborhood of Toronto. I have never shot one myself, but I have had specimens brought to me, which were said to have been procured not very many miles from here."² On July 29, 1904, Mr. E. F. Handy, C. E., observed a covey of Spruce Partridge on the tracks of the Grand Trunk Railway near Zephyr (about 45 miles northeast of Toronto); on inquiring Mr. Handy was informed that there had always been a few in the swamp lying between Mount Albert and Zephyr. This is no doubt the most southern point in Ontario where this partridge is found.

20. ***Tympanuchus americanus***. PRAIRIE HEN.—It is marked as having been taken at Toronto in 'Hand Book of Toronto,' 1858, 54, with the remark: "This is the Heath Hen of our Legislative Act for the preservation of game." McIlwraith records the taking of one at Hamilton in May, 1886,³ but it seems unlikely that this was a native bird as they were probably extinct by that date in Ontario, though imported birds may have been on some game preserve; but there is no probability that the bird ever came as far east as Lake Ontario.

21. ***Meleagris gallopavo fera***. WILD TURKEY.—Dr. Brodie says that many years ago (between 1840 and 1850), a well known and reliable hunter saw a flock on the west side of Yonge Street in the township of Whitechurch; none were taken, but the man's statement was generally believed at the time. Wild Turkeys certainly came as far east as Hamilton, and Mr. C. W. Nash was informed by an old resident of Dundas (a few miles west of Hamilton) that they were found at one time on a farm, now just outside the town limits.

22. ***Elanoides forficatus***. SWALLOW-TAILED KITE.—I have a specimen that is said to have been taken here many years ago; it is certainly an Ontario record.

23. ***Empidonax virescens***. ACADIAN FLYCATCHER.—The published

¹ Canadian Journal, V, 1860, 394.

² *Ibid.*, I, 1853, 171.

³ Birds of Ontario, 1886, 128.

records all refer to the Alder Flycatcher, but I took what I believe was this species once at Toronto, but the specimen was lost by the taxidermist who skinned it.

24. **Euphagus cyanocephalus.** BREWER'S BLACKBIRD.—I have a specimen that is said to have been taken here.

25. **Linota cannabina.** EUROPEAN LINNET.—Two specimens were seen in a flock of English Sparrows in January, 1890, by Mr. Wm. Loan, who took one alive. This bird was identified by Mr. Ernest Seton who says, "The question how the birds came here is not easily answered for this could not have been a cage bird escaped, as its breast still bore the rosy tinge that is so soon lost in captivity."¹

26. **Helminthophila chrysoptera.** GOLDEN-WINGED WARBLER.—Two taken at Hamilton;² one in the Holman collection was no doubt taken here.

27. **Icteria virens.** YELLOW-BREASTED CHAT.—Mr. John Boyd, of Sarnia, has a specimen which he believes was taken at the Humber in 1889, but he was never able to trace the bird back to the original collector.

28. **Wilsonia mitrata.** HOODED WARBLER.—One in the Holman collection, and one in the Allen collection, were no doubt taken here, one taken at Hamilton.³

29. **Protonotaria citrea.** PROTHONOTARY WARBLER.—A female taken at Hamilton May 23, 1888, by Dr. K. C. McIlwraith; it has been seen here at least once.

30. **Mimus polyglottos.** MOCKINGBIRD.—The Hamilton record given by McIlwraith⁴ is not altogether satisfactory, and Mr. C. W. Nash, who was familiar with the time and place of the record, is doubtful if the bird was correctly identified.

31. **Hylocichla fuscescens salicicola.** WILLOW THRUSH.—I have one, from the McIlwraith collection, taken at Hamilton, May 16, 1895, but it has not yet been detected here.

32. **Hylocichla aliciae bicknelli.** BICKNELL'S THRUSH.—Mr. Ridgway has recognized one bird from Toronto, and two from Hamilton as intermediate in size between this form and *aliciae*, but near *bicknelli* in color.

EXTRALIMITAL LIST.⁵

1. **Grus americana.** WHOOPING CRANE.—One taken at Yarker in the county of Addington, September 27, 1871, is still in the possession of Mr. John Ewart.⁶

¹ Transactions Canadian Institute, I, 1889-90, 16.

² McIlwraith, Birds of Ontario, 1886, 253.

³ *Ibid.*, 277.

⁴ *Ibid.*, 284.

⁵ Species recorded from the north shore of Lake Ontario, but not within the geographical limits of this paper; three of those previously mentioned (Auk, XXIII, 439) are in the hypothetical list.

⁶ McIlwraith, Birds of Ontario, 1894, 116.

2. ***Pica pica hudsonica*.** AMERICAN MAGPIE.—Two specimens taken at Odessa, near Kingston, in March 1898, are recorded by Dr. C. K. Clarke.¹

Corrections to Part I.

The footnote on p. 450 refers to No. 101.

Page 452, No. 4 of Hypothetical List, the reference to the footnote should be ⁶ instead of ⁵.

Page 452, No. 5 of Hypothetical List, ⁶ after the word list should be eliminated.

TWENTY-FOURTH CONGRESS OF THE AMERICAN
ORNITHOLOGISTS' UNION.

THE Twenty-fourth Annual Congress of the American Ornithologists' Union convened in Washington, D. C., Monday evening, November 12, 1906. The business meeting was held at 'The Portner,' corner of 15th and U Sts., N. W., and the public sessions at the U. S. National Museum, beginning Tuesday, November 13, and continuing three days.

BUSINESS SESSION.—The meeting was called to order by the President, Mr. Charles F. Batchelder. Twenty-two Fellows were present. The Secretary stated that at the opening of the present Congress the membership of the Union numbered 850, constituted as follows: Fellows, 48; Honorary Fellows, 16; Corresponding Fellows, 60; Members, 73; Associates, 653.

During the year the Union lost sixty-eight members, thirteen by death, thirty-one by resignation, and twenty-four for non-payment of dues. The deceased members include two Honorary Fellows, five Corresponding Fellows, and six Associates, as follows: Dr. Jean Louis Cabanis,² of Berlin, who died February 20, 1906, in the 90th year of his age, and Dr. William T. Blanford, of London,

¹ Auk, XV, 1898, 274.

² For an obituary notice, see Auk, XXIII, p. 247.

England, who died June 23, 1905, at the age of 72 years, Honorary Fellows; Emile Oustalet,¹ who died at Saint Cast, France, October 23, 1905, in his 61st year; Dr. Paul Leverkühn,² who died December 5, 1905, at Sophia, Bulgaria, in the 39th year of his age; Rev. Henry B. Tristram,³ who died in Durham, England, March 8, 1906, at the age of 83 years and 10 months; Victor Fatio,⁴ who died March 19, 1906, in Geneva, Switzerland, aged 67 years, and Sir Walter Lawry Buller, of London, England, who died July 19, 1906, aged 68 years, Corresponding Fellows; also the following Associates: George F. Breninger,⁵ who died December 3, 1905, at Phoenix, Arizona; Frederick C. Paulmier, who died March 3, 1906; La Rue K. Holmes,⁶ who died in Summit, N. J., May 10, 1906, in the 24th year of his age; Miss Grace V. Pomeroy, of Summit, N. J., who died May 14, 1906; Andrew J. Lloyd, who died in Brookline, Mass., June 14, 1906, aged 57 years, and Mrs. Julia Stockton Robins,⁷ who died in Philadelphia, July 2, 1906.

The report of the Treasurer showed the finances of the Union to be in a satisfactory condition.

All of the officers were reëlected as follows: Charles F. Batchelder, President; E. W. Nelson and Frank M. Chapman, Vice-Presidents; John H. Sage, Secretary; Jonathan Dwight, Jr., Treasurer; Ruthven Deane, William Dutcher, A. K. Fisher, Chas. W. Richmond, Thos. S. Roberts, Witmer Stone, and F. A. Lucas, members of the Council.

W. L. Sclater, of Colorado Springs, Col., was elected a Corresponding Fellow; Waldron DeWitt Miller, of New York City, and Arthur T. Wayne, of Mt. Pleasant, S. C., were elected to the class of Members, and the following eighty-four persons were elected Associates, namely:

Miss Edith Allen, Hartford, Conn.; R. C. Andrews, New York City; Frank E. Arnold, Providence, R. I.; Leslie B. Benson, Port Jefferson, N. Y.; W. H. Bingaman, Algona, Iowa; Miss E. D. Boardman, Boston,

¹ For an obituary notice, see Auk, XXIII, pp. 355, 356.

² For an obituary notice, see *Ibid.*, XXIII, p. 247.

³ For an obituary notice, see *Ibid.*, XXIII, p. 484.

⁴ For an obituary notice, see *Ibid.*, XXIII, pp. 484, 485.

⁵ For an obituary notice, see *Ibid.*, XXIII, p. 356.

⁶ For an obituary notice, see *Ibid.*, XXIII, p. 356.

⁷ For an obituary notice, see *Ibid.*, XXIII, p. 485.

Mass.; Campbell Bosson, Boston, Mass.; Ernest Boyd, St. Louis, Mo.; Arthur W. Brockway, Hadlyme, Conn.; D. E. Brown, Seattle, Wash.; C. S. Buchanan, New Haven, Mo.; Ernest A. Butler, Philadelphia, Pa.; James Chapin, New Brighton, N. Y.; Rowena A. Clarke, St. Louis, Mo.; Miss Lilian Cleveland, West Medford, Mass.; Chas. H. Davis, Saginaw, W. S., Mich.; Miss Elizabeth D. Davis, Pittsfield, Mass.; Mrs. Susan L. Davis, Newton, Mass.; Allen B. Doggett, Jr., Brooklyn, N. Y.; W. Linfred Dunbar, Bridgeport, Conn.; Alfred Eastgate, Harrisburg, N. D.; Dr. A. F. Eimbeck, New Haven, Mo.; Wm. S. Essick, Reading, Pa.; Douglas Forsyth, New Orleans, La.; Dr. Thos. B. Fletcher, Baltimore, Md.; James P. Garrick, Jr., Weston, S. C.; Stephen S. Gregory, Chicago, Ills.; Alden H. Hadley, Monrovia, Ind.; J. Downey Harvey, San Francisco, Calif.; Rev. Sullivan S. Healey, Pullman, Wash.; Michael F. Henchey, Unionville, Conn.; Carl F. Henning, Boone, Iowa; Stanley G. Jewett, Anthony, Oregon; Miss Anna C. Jonas, Detroit, Mich.; H. Cornelius Judd, Bethel, Conn.; Robert S. Judd, Bethel, Conn.; Clay Judson, Milwaukee, Wis.; Nathaniel T. Kidder, Milton, Mass.; Wm. Kilgore, Jr., Minneapolis, Minn.; Ernest Knaebel, Denver, Colo.; J. I. McCain, Due West, S. C.; Alexander Maitland, New York City; John S. Marley, Kansas City, Mo.; Wm. R. Maxon, Washington, D. C.; Prof. L. H. Miller, Los Angeles, Calif.; Clement Moore, Hackensack, N. J.; T. A. Morgan, Morgantown, W. Va.; Mrs. Harriet W. Myers, Garvanza, Calif.; Chauncey C. Nash, Boston, Mass.; C. W. Nash, Toronto, Ont.; Chas. H. Neff, Portland, Conn.; Stanley E. Piper, Washington, D. C.; Wm. G. Pitcairn, Allegheny, Pa.; Adelaide L. Pollock, Seattle, Wash.; Miss Grace L. Poole, Rockland, Mass.; Mrs. Gene Stratton Porter, Geneva, Ind.; John H. Price, Knowlton, Montana; James R. Ralph, Minneapolis, Minn.; Malcolm W. Rix, Utica, N. Y.; John T. Roberts, Jr., New York City; Chas. M. Roe, Chicago, Ills.; George A. Sanford, New York City; Herbert R. Sass, Charleston, S. C.; Bowen W. Schumacher, Chicago, Ills.; Joseph S. Seabury, Wellesley Hills, Mass.; George Shumway, Galesburg, Ills.; Dr. Clara Smith, Utica, N. Y.; G. Washbourne Smith, New York City; Byron L. Smith, Chicago, Ills.; Aubrey F. Smithson, Kansas City, Mo.; Gilbert M. Stark, Saginaw, W. S., Mich.; John H. Steele, Philadelphia, Pa.; Mrs. J. L. Sweiger, Waterbury, Conn.; Bennett M. Stigall, Kansas City, Mo.; Caroline M. Stevens, Portland, Me.; Chas. Darwin Test, Golden, Colo.; Harriet W. Thompson, Port Sanilac, Mich.; A. O. Treganzer, Salt Lake City, Utah; Julius T. Volkman, Webster Grove, Mo.; Clarence S. Wadsworth, Middletown, Conn.; Henry A. Ward, Milwaukee, Wis.; B. G. Willard, Millis, Mass.; Mrs. Frank B. Witherbee, West Newton, Mass.; Albert H. Wright, Ithaca, N. Y.

Drs. Allen, Dwight, Merriam and Richmond, and Messrs. Brewster, Ridgway and Stone were reappointed 'Committee on Classification and Nomenclature of North American Birds.'

Drs. Fisher, Elliot and Roberts, and Messrs. Chapman and Nelson were appointed 'Committee on Bird Protection,' and given authority to coöperate with a similar committee to be appointed by the National Association of Audubon Societies.

The amendments to the By-Laws, proposed at the last Congress of the Union, were adopted. The class known as Members is thereby increased from seventy-five to one hundred, and members are now to be nominated and elected in the same manner as Fellows. Nominations to either class must be made in writing, and each be signed by three Fellows. Such nominations must give the candidates name in full and his residence, and must be delivered to the Secretary at least three months prior to the Stated Meeting at which they are to be acted on.

PUBLIC SESSIONS. *First Day.*—The meeting was called to order by the President, Mr. Batchelder.

The papers read during the morning session were as follows:

'A plea for the Kildeer,' by William Dutcher.

'Where Wild Birds Sleep,' by Mrs. Irene G. Wheelock. Remarks followed by Mr. Chapman.

'Some Experiments with Nesting Birds,' by E. H. Forbush. Illustrated by lantern slides.

'Ornithological Notes from the West,' by Frank M. Chapman. Illustrated by lantern slides.

The only paper of the afternoon was by Wm. L. Finley on 'The Home Life of the California Condor.' Illustrated with lantern slides by H. T. Bohlman and the author. Remarks followed by Dr. Merriam, the author, and Mr. Chapman. A vote of thanks was given Mr. Finley for his interesting and valuable paper.

In the evening the members of the Union, and their friends, met at dinner at the 'Riggs House.' After the dinner an informal reception was held in the parlors of the same hotel.

Second Day.—The meeting was called to order by Vice-President Nelson.

The papers at the morning session were: 'The Life Zones of New York State as Determined by its Avifauna,' by E. Howard Eaton. Illustrated by lantern slides. Remarks followed by Dr. Merriam, Messrs. Rhoads, Howell, Todd, Dutcher, and the author.

'The Habits of a Young California Condor,' by Wm. L. Finley.

Illustrated with lantern slides by H. T. Bohlman and the author. Remarks followed by Dr. Merriam, and Messrs. Dutcher and Wood.

'An Exhibition of Lantern Slides,' by Wm. L. Bailey, with explanations.

'A Review of the genus *Junco*,' by Dr. Jonathan Dwight, Jr.

'Summer Bird Life of the Newark, New Jersey, Marshes,' by C. G. Abbott. In the absence of the author the paper was summarized by Mr. Chapman.

The papers presented at the afternoon session were:

'On Horseback Through the Deserts of Lower California,' by E. W. Nelson. Illustrated by lantern slides. Remarks followed by Mr. Chapman.

'Imitation in Bird Music — A Study of Wood Thrushes,' and 'Interesting Bird Songs noted in 1906,' by Henry Oldys.

Third Day.— The meeting was called to order by Vice-President Nelson.

The papers of the morning session were:

'Present Condition of Gull and Tern Colonies on the Atlantic Coast,' by Wm. Dutcher and B. S. Bowdish. Remarks followed by Prof. T. G. Pearson.

'On the Eastern Forms of *Geothlypis trichas*,' by Frank M. Chapman.

'Delaware Valley Wild Fowl — Past and Present,' by Samuel N. Rhoads.

'Bachman Warbler Breeding in Logan County, Kentucky,' by G. C. Embury.

'The Nest and Eggs of Bachman Warbler taken near Charleston, S. C.,' by Arthur T. Wayne. In the absence of the author it was read in part by Dr. Allen.

'A Question of Right Nomenclature,' by Wm. Palmer. Remarks followed by Dr. Stejneger, Messrs. Bartsch, Dutcher, Bond, Fuertes, Hitchcock, and the author.

'A Species or a Subspecies,' by Wm. Palmer. Remarks followed by Drs. Bishop and Merriam, Mr. Stone, and the author.

The papers of the afternoon, both illustrated by lantern slides, were as follows:

'Trails of a Naturalist in Nevada,' by H. C. Oberholser.

'Notes on Birds,' by Prof. T. G. Pearson.

Resolutions were adopted thanking the Board of Regents of the Smithsonian Institution for the use of a hall in the U. S. National

Museum for a place of meeting, and for other courtesies extended; to the Local Committee and other Washington members of the Union, and to the Audubon Society of the District of Columbia, for the cordial welcome and generous hospitality shown visiting members.

The next meeting of the Union will be held in Philadelphia, commencing December 9, 1907.

JNO. H. SAGE,
Secretary.

GENERAL NOTES.

Capture of the Glaucous Gull (*Larus glaucus*) in Boston Harbor, Mass.— On April 23, 1906, while gunning in Boston Harbor, off Quincy, Mass., with Mr. R. R. Freeman, we shot a Glaucous Gull (*Larus glaucus*). The specimen was in slightly immature plumage, having faint brown markings on the back and wings. It was in company with a flock of about four hundred Herring Gulls and especially attracted attention by being the only bird which, in response to calling and the waving of a handkerchief, approached within gunshot. The identification of the specimen was verified by Mr. William Brewster by the examination of one of the wings. — JOHN A. REMICK, JR., *Boston, Mass.*

Recent Occurrence of the European Teal and the Marbled Godwit near Portland, Maine.— My collection contains a male European Teal (*Nettion crecca*) which was shot in Casco Bay by a fisherman on April 6, 1903. I had the satisfaction of seeing it before it received the attentions of a taxidermist, thus making perfectly sure that no deception was practised in the case. It is a remarkably beautiful and highly typical specimen. So far as I am aware, it is the first of its kind recorded for this State.

The Great Marbled Godwit (*Limosa fedoa*) is represented in my collection by a female shot on Scarborough Beach, August 16, 1904, by Mr. George H. Cushman, a game warden. For many years the species has been almost unknown in this locality.— HENRY H. BROCK, *Portland, Me.*

Baird's Sandpiper at Newfound Lake, Hebron, N. H.— While on a morning's collecting trip September 4, 1906, on the marshes at the head of Newfound Lake, Hebron, N. H., we obtained a specimen of Baird's

Sandpiper (*Actodromas bairdii*) collected by F. G. Blake. It was in company with *Gallinago delicata*, *Actodromas maculata*, *A. minutilla*, *Totanus melanoleucus*, *T. flavipes*, *Helodromas solitarius*, *Actitis macularia*, and *Ægialitis semipalmata*. The bird is now in the mounted collection of Camp Pasquaney, Bridgewater, N. H. According to Mr. G. M. Allen's 'Birds of New Hampshire,' this is the fourth locality in which Baird's Sandpiper has been taken in the State.—FRANCIS G. AND MAURICE C. BLAKE, Hanover, N. H.

Another Limpkin (*Aramus giganteus*) in South Carolina.—A Limpkin was shot by Mr. W. L. Harris (who is the postmaster of Charleston) in his yard on Water Street, Charleston, in July, 1904. This specimen was first seen by Mr. Harris at breakfast time, on a morning of July, 1904; the bird was still there at noon, and he then said, "If that bird is there to-night, I'm going to shoot it," which he did. The specimen was mounted by a taxidermist in Charleston, and remained in the possession of Mr. Harris until last spring, when it was acquired by the Charleston Museum; unfortunately the sex was not determined.

The fact that this bird was taken in the city of Charleston, and near "East Battery," proves conclusively that there must be a regular migration northward after the breeding season in Florida, as I reported¹ the capture of two birds of this species that were taken in Aiken County, South Carolina, in October, 1890.

This Charleston specimen of the Limpkin has been recorded by Prof. Paul M. Rea, Director of the Charleston Museum, in 'Bulletin' of the College of Charleston Museum, Vol. II, No. 6, October, 1906.—ARTHUR T. WAYNE, *Honorary Curator Div. Birds, College of Charleston Museum.*

Note on the Clapper Rail in Maine.—Many years ago Mr. Samuel Hanson, of Portland, spoke to me about three examples of a large Rail from Falmouth, one of which he had shot and all of which he had examined. I did not see the birds, for this was long after they had been bagged, and none of them was, I believe, preserved; but they were identified by Mr. Hanson as Clapper Rails (*Rallus crepitans*). This identification I accepted.² Mr. Hanson was a man of education and standing, as well as a sportsman of wide experience in this country and abroad. Throughout his life, which ended a few months ago, he felt much interest in birds, especially in game birds. I think to-day, as I have always thought, that his identification of the rails could hardly have been questioned at the time when the record of them was made. But I now believe that he was mistaken and that the birds were King Rails (*Rallus elegans*). When they were recorded, no King Rails were known to have occurred in Maine.

¹ Auk, XXIII, 1906, 231.

² Bull. Nutt. Orn. Club, Vol. IV, p. 108.

When I cited ¹ the record in my list of the birds of Portland and vicinity, but one such Rail had been noted,² and that was shot in Scarborough. Now, however, there are two records ³ of King Rails from the very marsh on which Mr. Hanson found his birds. On the other hand, no Clapper Rails have been detected there or elsewhere in the vicinity of Portland since his identification was made. While the possibility that he was right remains, the probability that he was mistaken is so strong that I have felt obliged to call attention to it.

There is also to be considered a rail shot "about September, 1864" by Mr. Luther Redlon, and referred to in the original notice of Mr. Hanson's birds as "a probable" Clapper Rail, but not mentioned in my Portland list. If we adopt the hypothesis that the latter were King Rails, it can scarcely be doubted that the former was of the same species, and we are left without evidence that *Rallus crepitans* has occurred near Portland.—NATHAN CLIFFORD BROWN, *Portland, Me.*

A Wounded Sora's Long Swim.—While superintending the unloading of brick schooners at the Mt. Loretto dock, Pleasant Plains, Staten Island, N. Y., on September 20, 1906, I saw what I presumed to be a terrapin swimming along with the current of the ebbing tide. I sculled out in a small boat in order to investigate, and was surprised to find that the supposed turtle was a Sora Rail (*Porzana carolina*). As the boat drew near it beat the water frantically with its wings and made every effort to escape, but when finally captured, manifested a disposition to defend itself, and repeatedly struck my hands and fingers with its bill.

I confined the bird in a crate on one of the schooners, where a number of Sicilian laborers gathered around it, and signified their desire to make a meal of it. One of the laborers thrust a finger between the slats of the crate, and to my astonishment the rail rushed toward it with opened bill. In fact it showed little fear of human beings, pugnaciously resisting every intrusion, but when a small dog belonging on the vessel, approached and barked at it, the bird retreated in apparent terror to the opposite side of the crate.

A decided drooping of the Sora's right wing explained its disablement. It died within a few hours, and when I skinned it I found the muscles on the right side of the sternum badly bruised, and clothed with blood, as if the bird had flown forcibly against some hard object.

Judging from the direction from which the Sora had come, it must have swam all the way across Raritan Bay from the salt marshes near Jacksonville, New Jersey, a distance of at least nine miles.—ROBERT C. MURPHY, *Mt. Sinai, Long Island, N. Y.*

¹ Proc. Port. Soc. Nat. Hist., Vol. II, 1882, p. 30.

² Bull. Nutt. Orn. Club, Vol. VII, p. 60.

³ Brock, Auk, XIII, p. 79; *ibid.*, XIX, p. 285.

A Florida Gallinule on the Coast of Massachusetts.—While the barge 'Geo. W. Stetson' was passing over the shoals near Pollock Rip lightship, about July 30, 1906, a strange bird alighted during the night on the deck. The crew tried to capture it, and it flew to sea again and out of sight, but a little later returned to the vessel and was captured. It was brought here and given to me for identification; it proved to be a Purple Gallinule (*Gallinula galeata*). This would seem to be considerably out of its ordinary range. I liberated it on some fresh-water marshes here (Beverly, Mass.), hoping it would find its way south with some other birds in the fall migration.—FRANK A. BROWN, *Beverly, Mass.*

The Short-eared Owl and Savanna Sparrow Breeding in Wayne County, Michigan.—Prior to the present season of 1906 I have met with the Short-eared Owl (*Asio accipitrinus*) and Savanna Sparrow (*Passerculus sandwichensis savanna*) as migrants only, and there seems to be no record of their occurrence in the height of the breeding season. I now take pleasure in placing on record positive proof of both species breeding in the county.

SHORT-EARED OWL.—On P. C. 618, Village of Grosse Pointe Farms, there is a tract of about 40 acres of land which was once under cultivation, but later abandoned as too low and swampy for successful crop raising. This has grown to grass, weeds and rushes according to the various elevations. Here, on May 30, Mr. Herbert Spicer and the writer watched a Marsh Hawk to her nest. She was wary and it took an hour and a quarter to do it. Twice during that time a male Short-eared Owl rose from the weeds near a tongue of bushes, extending from the bordering bush land, and drove the hawk from that vicinity. On each occasion he remained about a half hour in the air, apparently taking delight in the exercise, sometimes sailing on outstretched wings but mostly pounding the air with powerful strokes, the wings appearing to touch above his back and sweep downward nearly the whole semicircle. We carefully marked the spot where he went down and later worked toward it. When about 400 feet away the female sprang into the air, just out of gunshot range, and was joined by the male as she passed over him. They drifted before the wind nearly two miles, then worked back and sailed above us high in the air. We did not search thoroughly for the nest, as it was late in the day, and when we left the owls could be seen perched on the dead top of a large elm in the woods. I returned, June 10, accompanied by Messrs. Spicer, Wisener and my brother and, as they are experienced field men, I felt certain of success if a nest existed. We soon flushed both owls and this time they kept on going and were seen no more. The nest was soon found on a higher portion of the field, about twenty rods from the bordering bushes and close to where the female was flushed. It was a mere platform of dead marsh grass, half an inch thick and covering a spot of bare ground ten by eighteen inches. The long 'saw-grass' formed an arch over the nest,

but there was an opening at the easterly end leading into an open space about two feet wide by four long — a sort of play and feeding grounds for the young. One young bird was all the nest contained, but as this owl lays from four to seven, and usually five or six, eggs we concluded the remainder had concealed themselves. A systematic search soon brought to light another of the brood. It was squatted down, with beak and throat lying flat on the ground, and well concealed by the thick grass, further aided by its blending colors. It was some days older than the other, judging by its more advanced feather development. These two being all I desired for my collection, we immediately left the neighborhood so as not to further disturb the family and possibly secure a set of eggs next year. It is worthy of note that the nest and vicinity was kept clean of all castings, down, feathers, etc., that would tend to betray its existence.

The young proclaimed their defiance by a loud snapping of the mandibles, sometimes varied by a hiss, and when alone in another room frequently uttered a mournful little cooing note. While I was in sight they made no attempt to walk and merely squatted closer to the floor as I approached and touched them, but the moment they supposed themselves alone they seemed inspired with new life. They stood up, glanced quickly around and started away on a rapid run with neck and head extended forward, but instantly stopped and squatted when I appeared. Both threw up castings of mouse fur and bones. I made skins of them that night but have since regretted not keeping one alive for study.

SAVANNA SPARROW.—May 6, 1906, I found this sparrow numerous about some mud flats partly covered and surrounded by weeds. This piece of ground contained about six acres of P. C. 122, Village of Grosse Pointe Farms. These birds I regarded as migrants, but the conditions favoring a possible nesting place I returned June 10, when I found five pairs and secured a young bird just learning to fly.

I was over this same ground June 17 and 24, but the entire colony had disappeared, nor were they anywhere on the several square miles of suitable territory in that part of the county. The owls, also, were seen for the last time June 17.

This tends to confirm my opinion of what should constitute a breeding record. Articles sometimes appear entitled the breeding of certain birds in certain localities but we find, upon perusal, that the statements are backed by no stronger evidence than the fact of observing the birds in the breeding season or the taking of a full grown young or a female showing conclusive evidence of having recently reared a brood. I believe nothing should be accepted as a positive record except the finding of a nest containing eggs or young or the taking of a young bird not yet able to fly well.

The above colony of sparrows disappeared between June 10 and 17, and the Short-eared Owls between June 17 and 24. They may have gone to the extensive marshy meadow lands in St. Clair County, but wherever they went the possibility was open of some ornithologist securing parents and young only a few weeks from the nest in a locality where they did not

breed. Many similar cases have come to my notice, especially among the warblers.—J. CLAIRE WOOD, *Detroit, Michigan*.

The Breeding Habits of *Empidonax virescens* in Connecticut.—On June 2, 1906, I was out collecting, in Stamford, Conn., with Mr. W. H. Hoyt. We were searching for a Hooded Warbler's nest in a dense laurel brake on the bank of a stream, when Mr. Hoyt found a nest of the Green-crested Flycatcher. The nest was compactly built, resembling a rather shallow nest of the Red-eyed Vireo, and was suspended from a fork at the end of a bush sapling about eight feet from the ground. The nest contained three fresh eggs. Both birds were shot, and upon dissection it was evident that the set was complete.

We proceeded about a mile up the river and there found an apparently well established colony of the birds. We first found a nest at the end of a limb of a large hemlock tree. The nest was about eight feet from the ground and was composed of shreds of inner hemlock bark. The cup was very shallow, and while the mass was packed into a fairly solid nest, a considerable number of shreds hung down in festoons from the nest for eight or ten inches. The three eggs were slightly incubated, and the female was so bold in their defence, darting at us and striking our hands when we touched the nest, that we were finally obliged to kill her with a stick before we could take the eggs.

Within 200 yards of this nest, we saw two other pairs of these birds, evidently breeding, although we were unable to find the nests. We found, however, six old nests, of which two were in hemlocks and four in bushes. The nests are so characteristic in situation and structure that I think there can be little doubt that these old nests were also those of *Empidonax virescens*. The nests are so frail that I do not believe they could hold together more than two years, which would seem to imply that three or four pairs have bred in this colony for several years.

On June 7, 1906, I returned to make another search for the nests. I clearly located three pairs of the birds and finally found one nest. It was composed of dead grass and was so roughly thrown together, with the strings and ends hanging down so loosely, that I should never have guessed it was a new nest had I not seen the bird fly to it. It also contained three eggs, and the bird was quite wild and shy. The nest was, as usual, in a fork at the end of a beech limb, about nine feet from the ground.

There are two unreported records by local collectors of *Empidonax virescens* breeding in Stamford (one by Mr. W. H. Hoyt, and one by Mr. G. Rowell), but they were made a number of years ago, and were merely rare and irregular finds. These records apparently show that the bird breeds regularly in Stamford, and is probably very much commoner with us than has been hitherto supposed.—LOUIS N. PORTER, *Stamford, Conn.*

***Empidonax griseus* Brewster vs. *Empidonax canescens* Salvin and Godman.**—In 'The Auk' for January, 1904, p. 80, I published a note showing that the two names given above apply to the same bird and that

canescens appeared in a February brochure of the 'Biologia' (by inadvertence said to be March in my note), thus antedating the publication of *griseus* in the April Auk for the same year, 1889. In this connection both Mr. Brewster, with whom the matter had been discussed, and the writer had overlooked a footnote in Ridgway's 'Manual N. A. Birds,' 2d ed., p. 599, giving the date of publication of *griseus* as Jan. 31, 1889. Further inquiry has brought to light the fact that the author's separates of the paper in which *E. griseus* was described bears the following imprint: "[Author's edition, published Jan. 31, 1889.]" This early publication, antedating the appearance of 'The Auk,' and also the part of the 'Biologia' containing the name *canescens*, gives unquestionable priority to the name *griseus*, of which *canescens* must stand as a synonym.—E. W. NELSON, *Biological Survey, U. S. Dept. Agriculture, Washington, D. C.*

The Raven near Portland, Maine.—In 1882 I made note¹ of a Raven, presumably *Corvus corax principalis*, which was killed in the town of Cumberland, near Portland, December 31, 1875. I examined the specimen at the time; but I do not know what became of it, and therefore cannot positively state that it represented *principalis*.

No doubt the Raven was to be found regularly about Portland in olden times;² but I am able to cite only one other record³ of its occurrence within recent years, and that is regrettably indefinite. I have never seen the bird alive near the city. I have, however, seen a second local specimen. A handsome male, quite typical of *principalis*, was taken on Cape Elizabeth, January 12, 1884, was secured in the flesh for my collection and was transferred, a few years later, to the cabinet of the Portland Society of Natural History where it remains (No. 3773, N. C. B.).—NATHAN CLIFFORD BROWN, *Portland, Me.*

Two Ravens (*Corvus corax principalis*) Seen at Harpswell, Maine.—In bringing the local status of the Raven up to date, it seems desirable to record two living examples which I saw at Little Mark Island, Harpswell, Maine, October 5, 1889. Little Mark Island is about nine and a half nautical miles nearly east of Portland.

The Raven was a bird with which I had had a long acquaintance: therefore, as I watched this pair under favorable conditions, and listened to their characteristic notes, I was perfectly sure of the identification.—ARTHUR H. NORTON, *Portland, Me.*

The Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) in Georgia.—A young male of this species was taken by Dr. Eugene Edmund Murphey at Augusta, Georgia, on September 23, 1893, and is now in his

¹ Proc. Portland Soc. Nat. Hist., Vol. II, p. 17.

² See Brewster, Birds of the Cambridge Region, p. 237.

³ Smith, Forest and Stream, Vol. XIX, 1883, p. 485.

collection. This specimen has been hitherto unrecorded. I am indebted to Dr. Murphey for the privilege of announcing its capture, which is the first record for Georgia. In the South Atlantic States this species was taken at Chester, South Carolina, by Mr. Leverett M. Loomis, on April 18, 1884. There is also a Florida record in Coues's 'Birds of the Northwest,' p. 188.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

A new Colorado Record for the White-winged Crossbill (*Loxia leucoptera*).—On each of several different mornings during the latter part of last August, a pair of these birds were seen and closely observed by me at a ranch situated on a small tributary of upper Bear Creek, in Clear Creek County, Colo., at an altitude of about 8400 feet. My observations were made at very close range, with the aid of an excellent opera-glass, and were fully corroborated by Mr. Charles C. Truesdell of Syracuse, New York, as well as by other members of our party. On each of the three or four occasions when we saw them, the birds flew down to a small stream and as we were generally within fifteen feet of them, we enjoyed most perfect opportunities to make them out in every detail of their "field characters." The male and female staid close to each other, permitting us to note in a most satisfactory way, their characteristic cross bills and conspicuous, white double wing-bars, tending to, but not quite attaining, confluence, as well as all other external features of form, marking and coloration that characterize the species. On one occasion a female Mexican Crossbill (*L. curvirostra stricklandi*) joined the White-wings at the water's edge, and associated with them in a friendly way for several minutes, thus affording to me an excellent chance for comparison. The greater compactness and elegance, and smaller size, of the female *leucoptera* were noticeable. The Mexican, after remaining with the others for a time, joined her mate in a near-by spruce tree, where both staid motionless, though waiting for their aristocratic friends to conclude their repast (whatever it was). When the latter took flight the Mexican Crossbills left their perch and followed closely after.—ERNEST KNAEBEL, *Denver, Col.*

An Early Date for the Arrival of the Ipswich Sparrow (*Passerculus princeps*) on the Coast of South Carolina.—Being desirous of ascertaining the date upon which this species makes its appearance in the autumn, I visited Long Island (near Charleston) on November 3, 1906, and am satisfied that I flushed one, but was unable to secure it as it was very wild. On November 6 I again visited the island and succeeded in obtaining a female about four miles from the place where the specimen was flushed on the 3d. The specimen taken was moulting the feathers about the throat.

According to Mr. Brewster,¹ the Ipswich Sparrow occurs along the coast of Massachusetts by the middle of October. From Boston or Cape Cod to Charleston by the coast line is very nearly one thousand miles,

¹ W. Brewster, in H. D. Minot's Land-birds and Game-birds of New England, ed. 2, 1895, 201.

wich, Vt., when two swallows, perched on a dead limb over the water, attracted my notice. A near view at once made their identification as Rough-winged Swallows certain. On a visit to the same place the following day, I found the swallows still about, and in hopes of obtaining a breeding record I began to search for a nest.

On May 12 I was rewarded by seeing the pair of swallows flying back and forth to a clay bank beside the road. There, about twenty feet up, was a hole into which the birds were carrying grass and leaves for lining material. The tunnel, measuring 20 inches in length, slanted slightly upward, and contained a nest at the further end. The hole was noticeably larger in diameter than those of a colony of Bank Swallows in a bank near by.

My observation of their nesting was interrupted more or less by other work and so is not as complete as I wish. During the last two weeks of May the swallows were busy incubating, both taking turns at sitting on the eggs. In early June the young were hatched and both birds took care of the young. Unfortunately I had to leave before the young birds were able to fly.

April 29, 1906, I found the pair of Rough-winged Swallows again flying back and forth over the river. They returned to the old nest, which they cleaned out and relined, and again used to rear their young. Their return to the old nest leads me to feel quite sure that they have used the nest for a number of years, and I shall look for them again next spring.

That a pair of Rough-winged Swallows have chosen this spot to breed in, seems of unusual interest to me, because in a heavy hemlock woods not more than one hundred yards distant, Winter Wrens, Red-breasted Nuthatches, and a pair of Northern Pileated Woodpeckers breed.—FRANCIS G. BLAKE, *Hanover, N. H.*

A New Hampshire Record for *Stelgidopteryx serripennis*.—The pair of Rough-winged Swallows mentioned above have often been observed to fly across the Connecticut river into New Hampshire territory at Hanover. According to Mr. G. M. Allen's 'Birds of New Hampshire,' this is the first record of Rough-winged Swallows in the State.—FRANCIS G. BLAKE, *Hanover, N. H.*

The Philadelphia Vireo (*Vireo philadelphicus*) in Georgia.—An adult male of this vireo was taken by Mr. George P. Butler on September 17, 1890, in Richmond County, Georgia. This specimen is now in my collection.

The Philadelphia Vireo is a *rara avis* in the South Atlantic States and I have never met with it. As far as I am aware there are no records for North and South Carolina, or Florida.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Connecticut Warbler in Maine.—September 16, 1906, in the woods of Cape Elizabeth, I saw a warbler which I could not fully identify at the time, but which answered the description of a Connecticut Warbler, the white eye-ring being particularly prominent. The following day, September 17, 1906, a cat brought to a cottage, about 200 yards from the spot where I saw the above mentioned bird, a young male Connecticut Warbler. The specimen was taken to Mr. Arthur H. Norton, curator of the Portland Society of Natural History, and was verified by him. The skin is now in the collection of the Society. This, I believe, is the seventh record of this warbler in southwestern Maine. The previous six records are as follows: Brown, Cape Elizabeth, Aug. 30, 1878, Abstract Proc. Portland Soc. Nat. Hist., 1882; Goodale, Saco, Sept. 1885, Sept. 8, 1886, and Sept. 15, 1886, Goodale in Auk, Vol. IV, p. 77; Norton, Westbrook, Sept. 20, 1896, Bull. Univ. of Maine, No. III, p. 119; Norton, Westbrook, Sept. 5, 1901, Journal Maine Ornith. Soc., Vol. VI, p. 47.—W. H. BROWNSON, *Portland, Me.*

Cinclus mexicanus not a Costa Rican Bird.—In 'The Auk' for October, 1891, Mr. Cherrie extended the range of the American Dipper (*Cinclus mexicanus*) "south from Guatemala to Costa Rica" and stated that "*C. mexicanus* is a comparatively common bird along many of the mountain streams" in the last named country while its congener, *C. ardesiacus*, he considers rare. This record was cited, with an interrogation mark, in the synonymy of *C. mexicanus mexicanus* on p. 678 of Part III, 'Birds of North and Middle America,' with the observation, in a footnote, that possibly the Costa Rican bird "represented a different form." Since the publication of Part III I have been able to examine the specimens in the Costa Rica National Museum, with the result that all the specimens labeled *C. mexicanus* (in Mr. Cherrie's handwriting) are adults of *C. ardesiacus* while those labeled *C. ardesiacus* (also by Mr. Cherrie) are young of that species. The two stages are so conspicuously different in coloration (the young of *C. ardesiacus* being nearly pure white beneath) that, in the absence of specimens of *C. mexicanus* for comparison, it is scarcely to be wondered that Mr. Cherrie mistook them for distinct species.—ROBERT RIDGWAY, *Washington, D. C.*

A Carolina Wren in Middlesex Fells, Massachusetts.—On November 20, 1906, the call-notes of a wren were heard within the border of this State Reservation on the Wyoming side, and upon investigation the bird was found to be a Carolina Wren (*Thryothorus ludovicianus*). It was moving in and about piles of cord wood laid up in the work of cutting out and sawing the large pines and hemlocks which the gypsy moths have killed. I stood with my back to one pile while the activity of the wren about another pile was observed and enjoyed with keen interest. Presently it came over into the pile beside which I stood and worked in among

the sticks of wood and out onto the top within four or five feet of me, affording views at very near range. The coloration was strong in its reddish brown above, shading brighter from the crown to the rump, and in its decided ochraceous-buff tint below; while when the head was thrown back the throat showed almost clear white. Conspicuous over the eye was the white line and clearly discernible were the white outer edges and spottings of the wings. From the wood piles the wren moved up among the sharp rocks of the hillside, going in and out of the holes between the rocks. The following day it was again visited and found in the family woodpile of the only house standing near and within the reservation. Here it passed back and forth, in and out, from woodpile to refuse heap of old blinds and fencing and through a cart-shed near by. Upon subsequent visits of myself and friends up to November 29 the wren appeared more shy and less disposed to afford good views of itself, remaining hidden for an hour, it might be, without even uttering a call-note and then suddenly appearing.

The last published records of Carolina Wrens in this vicinity are those in Mr. William Brewster's valuable work on the 'Birds of the Cambridge Region,' 1906, in which one is given as seen by Mr. Ralph Hoffmann on May 4, 1902, in Belmont (Auk, Vol. XIX, p. 292), and one again March 7, 1903, about a mile distant from the previous locality, also in Belmont, and continuing to be seen by local observers to the end of May, regarded as perhaps the same bird as seen in 1902. Early in June, 1903, Mr. William P. Hadley killed a Carolina Wren on Arlington Heights, whither it is thought this same bird may have strayed. Messrs. Howe and Allen in their 'Birds of Massachusetts' give six other records within the State between the years 1876 and 1899 inclusive. To these are to be added two later records in 'The Auk,' namely, one (Vol. XVIII, p. 397), giving the first definite record of the species nesting in the State, namely, on Naushon Island, July, 1901, and the other (Vol. XX, p. 69) giving Mr. Owen Durfee's account of taking a young bird in juvenal plumage at Fall River, Sept. 6, 1902.

The Middlesex Fells bird would seem, therefore, to be the tenth which has been recorded within the State in a period of thirty years.—HORACE W. WRIGHT, *Boston, Mass.*

Some Corrected Records.—A few changes should be made in Mr. Bailey's paper on birds of western Mexico published in 'The Auk,' October, 1906, pp. 369–391. These are as follows:—No. 32, *Ortalis vetula macalli* should read *Ortalis wagleri*. *O. v. macalli* is limited to northeastern Mexico.

No. 67, *Myiarchus lawrencei* should read *Myiarchus lawrencei olivascens*. *M. lawrencei* belongs to eastern and southern Mexico.

No. 68, *Myiarchus lawrencei olivascens*, from Cleofas Island, should read *Myiarchus lawrencei tresmariae*, the latter being the resident form on all the Tres Marias Islands.

No. 76, *Carpodacus mexicanus* subsp.? = *Carpodacus mexicanus rhodocolpus*, the common resident form at Tepic.

No. 77, *Spizella socialis* subsp.? = *Spizella socialis arizonæ*, which is not uncommon about Tepic at certain seasons.—E. W. NELSON, *Biological Survey, U. S. Dept. Agriculture, Washington, D. C.*

Rare Northern Birds near Chicago, Ill.—Two miles north of Waukegan, Ill., is a low barren tract of sand interspersed with low sand hills and ridges and small sloughs, the northern end of which is sparingly planted with white pines, the greater part of which, I learn, were placed there in the early seventies, by Mr. T. H. Douglass of Waukegan. The ground is thickly covered with juniper and cedar. From November 5 to 13, this year (1906) I have observed and taken the following birds:

Penthestes hudsonicus hudsonicus. Three specimens seen, two taken.

Spinus pinus. Several large flocks seen, eight taken.

Acanthis linaria linaria. Two large flocks seen, twelve taken.

Pinicola enucleator leucura. Two seen, two taken. At Lake Forest, Ill., a flock of six have been feeding on the box-elder trees.

Loxia curvirostra minor. Two or three small flocks have been seen and a number taken. Three birds which I have, exceed some measurements of *stricklandi*.

Loxia leucoptera. A great many small flocks seen and a number of specimens taken. These birds are feeding on the juniper berries.

Plectrophenax nivalis. A few small flocks of this bird were seen on the Lake shore; the first visit we have had for several years of this bird.

Coccothraustes vespertinus. A small flock of these birds have been seen at Waukegan by Mr. T. H. Douglass.

Ampelis garrulus. A small flock seen by Mr. Douglass in his yard.—FRANK M. WOODRUFF, *Chicago Academy of Science, Lincoln Park, Chicago, Ill.*

Telescope Observations of Migrating Birds.—At Urbana, Illinois, between 9.45 and 10.45 p. m. on the seventh of last October, the writer watched migrating birds through a four-inch telescope directed toward the moon. The diversity in the direction of the flight on this evening seems worthy of record. Out of a total of fifty-four birds, forty-two were flying in a general southerly direction, about one-half of these passing directly southward, while others were headed southwest or southeast. A few passed nearly eastward or westward. The remaining twelve, or nearly one-fourth of the entire number, were flying in a general northerly direction. In determining the direction it was assumed that the flight in all cases was horizontal. Between 9 and 9.20 on the same evening Professor Joel Stebbins, of the department of astronomy, counted thirteen birds flying southward and five flying northward. The wind was from the southeast, and had a velocity of only five miles an hour, as shown by an anemometer record. The temperature at 9 p. m. was 52° F.

An attempt was made to measure the speed of the birds by the method described by Professor Stebbins and Mr. Fath in 'Science' for July 13, 1906. Two telescopes are placed a measured distance apart on a line running north and south. The lines joining the telescopes with the moon are practically parallel, and the time taken for a bird to pass between these lines gives the rate of flight. On this evening only two birds were seen by both observers. The birds were flying southward. Professor Stebbins's calculations indicated that the rate of one was about sixty-eight miles an hour and that of the other about ninety-three miles an hour. — F. W. CARPENTER, *University of Illinois*.

A Migration Disaster in Western Ontario.—The early days of October, 1906, were warm and damp, but on the 6th came a north wind which carried the night temperature down to nearly freezing. Near there it stayed with little variation until the 10th, and on the 10th, the north wind brought snow through the western part of Ontario. At London there was only 2 or 3 inches, which vanished early next day; and the thermometer fell to only 32 degrees on the night of the 10th, and to 28 on the 11th, but ten miles west, there was 5 inches of snow at 5 P. M., Oct. 10, and towards Lake Huron, at the southeast corner, between Goderich and Sarnia, the snow attained a depth of nearly a foot and a half, and the temperature dropped considerably lower than at London. On that night, apparently, there must have been a heavy migration of birds across Lake Huron, and the cold and snow combined overcame many of them, so that they fell in the lake and were drowned.

Thanksgiving day fell on the 18th, and Mr. Newton Tripp of Forest, spent the day on the lake shore, near Port Franks, and observed hundreds of birds on the shore dead, cast up by the waves. He wrote me about it next day, calculating 5000 dead birds to the mile, and I took the first train to the scene of the tragedy and drove out to the lake shore that night. On the morning of the 21st, I patrolled the beach south from Grand Bend, and after covering several miles and seeing only a few dead birds, I came at last to the region of death. At first the birds were not very close together, but eventually became so plentiful that in one place I put my foot on four, and saw as many as a dozen in four or five feet.

I began a census at once, which I continued until the lengthening shadows warned me to hurry on to the river so as to cross in daylight, but in the two or three hours spent in the count I recorded the following:

1 Black-throated Green Warbler,	4 Robins,
1 Yellow Rail,	5 Fox Sparrows,
1 Blue-headed Vireo,	5 Savanna Sparrows,
1 Red-eyed Vireo,	5 Palm Warblers,
1 Yellow-bellied Sapsucker,	7 Myrtle Warblers,
2 Black-throated Blue Warblers,	12 Lincoln Sparrows,
3 Flickers,	15 Ruby-crowned Kinglets,

18 White-crowned Sparrows,	100 Winter Wrens,
19 Rusty Grackles,	130 Swamp Sparrows,
20 Hermit Thrushes,	131 Golden-crested Kinglets,
22 Brown Creepers,	153 White-throated Sparrows,
24 Saw-whet Owls,	358 Tree Sparrows,
30 Song Sparrows,	417 Juncos.
Total, 1845.	

After consuming all the time I could spare in this work, I walked over two miles or so of beach, where the birds were more common than on the shore where the count was taken; this brought me within half a mile of the mouth of the Sable River, and I then crossed it and turned my steps inland to a railway station.

In Mr. Tripp's letter he spoke of the birds extending for miles along the beach, and I did not even touch the ground he mentioned.

After my return I wrote to various persons near the lake shore and the information received shows up this migration in rather a strange light. It appears that from below Grand Bend, the birds were very numerous until beyond Stoney Point, but towards Kettle Point they diminished and were not plentiful again until Blue Point, beyond which they were "laying six deep in one place." Thus it appears that from the region near Kettle Point to near Blue Point there were very few birds, while northeast of Kettle Point and southwest of Blue Point the destruction was very great.

The northeastern section, of which I covered perhaps two miles, would have approximately 1000 birds to the mile, and the whole section might be perhaps ten miles; the western section probably was thickly covered but the length is unknown, possibly three miles, or perhaps even ten.

The lighthouse keepers to the north report no damage, so it is likely that the migration was limited to the district referred to.

It was a surprise to me to learn that the birds crossed Lake Huron, but Mr. W. W. Cooke tells me that he believes that "the birds fly lengthwise of Lake Huron, *i. e.*, north and south, and also diagonally, northwest and southeast, in either case making the longest possible flight over water. The greatest distance they could find on Lake Huron would be less than 200 miles."

Whether this migration was a southern or southeastern one is hard to say. If southeastern, why were there few from Kettle Point (12 miles) to Blue Point, and if southern, why did not the birds, instead of flying parallel with the east shore, turn east and be saved? I hope some of the migration specialists may be able to throw some light on this matter.

In questioning the few residents I saw, they concurred in saying that this occurrence had no parallel in their experience.

A few notes on the status of the migration of the species in this disaster may be of interest.

The first migration of Juncos in any number was observed at London

September 30, and a vast number had passed before the date of the storm.

Tree Sparrows were just coming, and were first seen near London October 22.

White-throats began to arrive in numbers September 15, and no more were noted after October 14, one week earlier than their average date of departure.

Golden-crowned Kinglets arrived at London September 25, and the movement had nearly ceased by October 10.

Swamp Sparrows do not come under my observation very much in the fall, and the last was seen September 5.

White-crowned Sparrows passed through without notice.

Two Lincoln Sparrows were seen near London September 5 and 20, October 3 being the latest record in any year.

Not more than one Savanna Sparrow was noted on any day after October 3.

Fox Sparrows were not observed at London until October 28, though the average date of arrival is October 3.

The migration of Winter Wrens reached London September 15, and the last was noted September 20; since then, one specimen only, on October 30. The average date of the last specimen is October 22.

The Saw-whets were a surprise. They are rare in western Ontario, and one sees them only at intervals of many years. Evidently they migrate in considerable numbers.

The length of the Robin flight at London was from September 26 to October 5.

Flickers and Yellow-bellied Sapsuckers were last seen on October 7.

Red-eyed Vireos were last seen October 12, which is the very latest date I have, and have only one other October record.

Blue-headed Vireos were last seen on September 28.

Black-throated Blue Warblers were last seen on September 20, and Black-throated Green on October 3.

Hermit Thrushes had nearly all passed, but were seen until October 16.

I have been a careful student of migrations for many years, but the lesson of this storm shows how many species and individuals one may miss when the birds are silent.— W. E. SAUNDERS, *London, Ontario*.

Early Appearance of Certain Northern Species at Ottawa, Canada.—

Judging by the unusually early arrival of some of our northern wanderers, and the greater abundance of others this fall, there must be queer conditions prevalent to the north of us.

A Hawk Owl (*Surnia ulula caparoch*) was shot and bought to me October 9, and another was seen at the same time. At that time it was very mild here. Several more were brought to a local taxidermist.

The Goshawk (*Accipiter atricapillus*) in the blue plumage, is far more abundant than usual. On October 18 a large, fine female was shot by a farmer across the river, in the act of carrying away a good-sized Plymouth

Rock rooster. On November 3, a boy shot one near the Rifle Range, which had just put itself on the outside of a Ruffed Grouse. Mr. E. G. White noticed two large ones, and shot them, near Pembroke, in the next county; one was in the act of devouring a grouse. The taxidermist got some more to mount, all in the finest blue plumage, save one which I saw in the market, which was in the immature plumage. Mr. E. Beaupré of Kingston writes me, that he never saw so many Goshawks together as this year. There were regular flights of them passing over the city. He saw them almost every day in October, but during the first week in November they were most abundant. He saw seven flying at one time. One he approached quite close while on a stump tearing a Hairy Woodpecker. Another tried to make a meal of a wooden decoy duck. Many were brought to the local taxidermists.

The Pine Grosbeak (*Pinicola enucleator leucurus*) was also unusually early this year. The first ones were seen November 3 near the Rifle Range; one was found dead on the Experimental Farm, November 5. At the same time Mr. E. G. White reported them as extremely common near Pembroke, Renfrew County. And from then till now, they have stayed here. At first they were more common on the outskirts of the city, in sumac patches, but now they have invaded the city, as they did three years ago, only then they came somewhat later. They stay and feed on the many mountain ash trees in the city.

The Snowy Owl (*Nyctea nyctea*) seems again to have given Ottawa a wide berth, whereas further south many are reported. I have seen only one thus far, which was shot about November 5 up the Gatineau valley, about 30 miles north. Mr. E. G. White reports another one having been seen near Pembroke.

I saw one Richardson's Owl (*Cryptoglaux tengmalmi richardsoni*) only, which had been shot November 16, at Ottawa.—G. EIFRIG, *Ottawa, Canada*.

Audubon's Ornithological Biography.—In 'The Auk,' Vol. XXI, 1904, p. 286, Mr. Reginald H. Howe called attention to a copy of Volume I of this work, which he had purchased, bearing the following imprint: "Philadelphia: Judah Dobson, Agent, 108 Chestnut Street; and H. H. Porter, Literary Rooms, 121 Chestnut St. MDCCCXXXI." Mr. Howe stated that he was unable to find this imprint in any other copy.

Since that time I have made careful search and have only recently found a similar copy. This one has been acquired of the John Crevar Library of Chicago, and bears the presentation inscription to the late William LeBaron, M. D., Entomologist, of Geneva, Ill., in 1835.—RUTHVEN DEANE, *Chicago, Ill.*

RECENT LITERATURE.

Beebe's 'The Bird.'¹ — The scope of this excellent work is indicated by the captions of the seventeen chapters into which it is divided, as follows: 'I. Ancestors' (pp. 1-18), devoted to an account of the early forms of birds, with a discussion of the origin of the bird type and its relation to other vertebrates. 'II. Feathers' (pp. 19-61), treating of their structure, development and arrangement, and of moult and color. 'III. The Framework of the Bird' (pp. 62-102), deals with the skeleton, in comparison with that of other vertebrates. 'IV. The Skull' (pp. 103-115). 'V. Organs of Nutrition' (pp. 116-141). 'VI. The Food of Birds' (pp. 142-164), in reference to its character, mode of procurement, and the special adaptations involved therefor in different groups. 'VII. The Breath of a Bird' (pp. 165-187), or an account of the respiratory organs. 'VIII. Muscles and Nerves' (pp. 188-202). 'IX. The Senses' (pp. 203-222). 'X. Beaks and Bills' (pp. 223-251), their structure and their exceedingly diverse modifications and varied uses. 'XI. Heads and Necks' (pp. 252-284), their peculiarities in different groups and their wonderful adaptations. 'XII. The Body of a Bird' (285-318), in which is treated not merely the variations in its size and form, as correlated with mode of life, but a varied category of other subjects, as the color and texture of the plumage in relation to habits; geographical and other variations in color and their probable causes; adaptive colors, etc. 'XIII. Wings' (pp. 319-352), the various types in relation to modes of flight and manner of life, etc. 'XIV. Feet and Legs' (pp. 353-397), showing variation with function. 'XV. Tails' (398-426), a fruitful subject for illustration with reference to form and use. 'XVI. The Eggs of Birds' (pp. 427-461), and 'XVII. The Bird in the Egg' (pp. 462-482), the latter devoted to the embryology of birds. An 'Appendix' (pp. 483, 484) gives the titles of "a few excellent books relating directly or indirectly to ornithology," and is followed by a full and well-planned topical index.

Other works of much the same scope have appeared in recent years, but none with such a wealth of original illustrations, nor so well adapted to the needs of the general reader and amateur bird student. The treatment is popular, avoiding needless technicalities, well-balanced and eminently original. It is evidently written from the basis of a wide range of first-hand knowledge, and with an inspiration begotten of real interest

¹ American Nature Series | Group II. The Functions of Nature | — | The Bird | Its Form and Function | By | C. William Beebe | Curator of Ornithology of the New York Zoological Park and Life Member of the | New York Zoological Society; Member of the American Ornithologists' | Union and Fellow of the New York Academy of Sciences | Author of "Two Bird-Lovers in Mexico" | With over three hundred and seventy illustrations | chiefly photographed from life | by the Author | [Vignette] New York | Henry Holt and Company | 1906 — Large 8vo, pp. xi + 496.

in the subject. Moot questions are discussed with commendable conservatism, and the book is thus a safe guide to the inexperienced searcher for knowledge.

The author's opportunities for the study of a wide range of bird types in life, through his curatorship of birds at the New York Zoological Park, have given him advantages that few can share, and the pages of 'The Bird' are enriched by many original and hitherto unpublished observations. We note very few slips of any importance, and are therefore surprised to find it stated (p. 297) that the male Bobolink "changes from the buffy female dress to his rich black-and-white spring suit" merely by the wearing off of the brittle feather tips. The context does not lead one to suppose that the male Bobolink acquires his nuptial dress by a full spring moult, which no one better than the author of this book must know occurs, but which for the moment he forgot to imply. There is, as he states, a speedy wearing off of the brown feather-tips *after the spring moult*, beneath which the black is at first more or less veiled.

His accounts of protective coloration and geographical variation, while brief, give a good general statement of the facts, and, as is the case in nearly every instance where broad subjects, open to speculative explanation are touched upon, these topics are treated with commendable reserve. On the whole 'The Bird' fills a peculiar niche of its own, and must prove a mine of welcome information to a wide class of readers.—J. A. A.

Hellmayr on Spix's Types of Brazilian Birds.¹—In the year 1817 the King of Bavaria, Maximilian Joseph I, sent a scientific expedition to explore the rich fauna and flora of Brazil. Dr. J. B. von Spix was the zoölogist and Dr. C. P. von Martius was the botanist of this expedition, one of the most famous and successful of the several scientific expeditions sent out by different European governments during the first half of the nineteenth century for the exploration of the natural history of South America. Spix and Martius reached Rio de Janeiro the 14th of July, 1817, and sailed from Para on their return to Europe on the 14th of June, 1820. During these three years they explored a large part of southern Brazil, and the Amazon from its mouth to eastern Ecuador, including journeys up some of its principal tributaries, as the Rio Negro and the Rio Madeira. The ornithological results, by Spix,² were published in two large quarto volumes, the first in 1824, the second in 1825, under the title 'Avium Species Novæ, quas in itinere per Brasiliam annis 1817-1820,' etc. In this work, according to Hellmayr, about 220 species of birds were described as new or given new names. Of these only about 100 remain in good standing, while a few, through the loss of the types, are not clearly determinable.

¹ Revision der Spix'schen Typen brasilianische Vögel. Von C. E. Hellmayr. Abhandl. der K. B. Akademie der Wissenschaften, II Kl., XXII Bd., III Abt., pp. 563-726, Taf. 1, 2, May 20, 1906.

² Johan Baptist von Spix, born 9 Feb., 1781; died 15 May, 1826.

Spix and Martius were the first explorers to bring to European museums any considerable number of specimens from the Amazon region and the northeastern States of Brazil; in southeastern Brazil they were preceded by Prince Wied, and Spix's names for many supposed new species were forestalled by those of other authors. Spix also designated many other species by new names which had been previously described, through his inattention to the literature of the subject.

In his introductory remarks Hellmayr directs attention to the fact that the plates (hand-colored) in Spix's work differ greatly in the coloring in different copies — a fault sadly not limited to the Spix bird plates!

The Spix-Martius expedition specimens of birds were mounted, according to the custom of that time, and thus have suffered for some seventy years from the fading influence of light, while some have become moth-eaten; the original labels have in many cases been lost, but fortunately the specimens proved in most such cases to be identifiable by the catalogue records. The Spix specimens have now, except in the case of some of the larger species, been unmounted, carefully labeled, and merged with the skin collection of the Munich Museum. It is to be regretted that Spix failed to record, either in his '*Avium Species Novæ*' or on his labels, the exact locality where his specimens were taken, the records, in many cases simply giving '*Brasilia*' as the place of capture.

The revision of the Spix material, our author states, occupied him the greater part of two years, and in its identification he did not limit himself to the resources of the Munich Museum but made direct comparison with the necessary specimens in various other European museums, especially with those in the rich collection of Count Berlepsch, to whom he makes acknowledgment for valued assistance in his work. Thus the '*Revision*' has been made with exceptional care. Although entitled a '*Revision of Spix's Types of Brazilian Birds*,' it is much more than this, as it includes not only the actual types of Spix's new species, but all of the known extant specimens of birds of the Spix-Martius Expedition; and not only this, it includes incidentally the revision of many obscure groups of South American birds, and much critical comment on questions of nomenclature and synonymy, which must prove of advantage to future workers in the same field. Incidentally, also, quite a number of species and subspecies are characterized as new or receive new names. The memoir closes with a valuable concordance, showing the proper modern equivalents of all of the birds included in Spix's work, as interpreted by Dr. Hellmayr.—J. A. A.

Thayer and Bangs on Sonoran Birds.—This is mainly a nominal list¹ of the breeding birds of the Sierra de Antonez, in north central Sonora—a region previously little known. The principal localities are Opodepe, at

¹ Breeding Birds of the Sierra de Antonez, North Central Sonora. By John E. Thayer and Outram Bangs. Proc. Biol. Soc. of Washington, Vol. XIX, pp. 17–22, Feb. 26, 1906.

2000 feet altitude, and La Chumata mine, at 4500 feet altitude. The list (67 species) is based on a collection made by Mr. W. W. Brown, Jr., mainly during the month of May, 1905, and hence at the height of the breeding season. Many nests and eggs were taken. A new subspecies is *Psaltiriparus plumbeus cecaumenorum*, and there are technical notes on a few other species.—J. A. A.

Lönnberg on the Birds of South Georgia.—The present memoir¹ is based on collections made on the island of South Georgia by Mr. Erik Sörling for the Swedish Natural History Museum in Stockholm. Sörling, accompanying Captain C. A. Larsen on a whaling voyage to the antarctic seas, was able to spend the period from the middle of November, 1904, to the end of September, 1905, on South Georgia. He had thus nearly a full year on the island and secured important collections and valuable observations, especially on the seals, whales, birds, and fishes. The first important report on the birds of South Georgia was based on the material obtained by the German Antarctic Expedition of 1882–1883, papers on which were published by Pagenstecker and von den Steinen, respectively in 1885 and 1890, by whom 22 species were recognized as occurring on the island, and 19 as breeding. The Swedish Antarctic Expedition of 1902 added, as recorded by Lönnberg, one more to the total number, and also one to the list of breeding birds; Sörling added still another, making 21 known to breed, and raising the total number thus far recorded, including occasional stragglers, to 29. In the present memoir all are treated at greater or less length; of 25 species Sörling obtained specimens, often in series, representing both young and adult, and frequently including skeletons as well as skins. Sörling's field notes, given in abstract or at length, are of special interest, while the author has made his report on the birds a summary of the present knowledge of the ornithology of South Georgia. There is a colored plate of a chick of *Chionis*, color sketches from life of the head and bill of *Nettion georgeum* and of *Phalacrocorax atriceps*, and reproductions of photographs of the King Penguin, Great Skua, and a rookery of *Pygocelis papua*. The only land bird recorded is the Antarctic Pipit (*Anthus antarcticus*).—J. A. A.

Harvie-Brown's 'A Fauna of the Tay Basin.'²—This is the tenth volume of 'The Vertebrate Fauna of Scotland' series, edited, and in part written by J. A. Harvie-Brown and the late Thomas E. Buckley. Following

¹ Contributions to the Fauna of South Georgia. I. Taxonomic and Biological Notes on Vertebrates. By Einar Lönnberg. Sv. Vet. Akademiens Handlingar, Bd. XL, No. 5, 1906, pp. 1–102, pll. i–xii, and 7 text figures. Birds, pp. 50–90, pll. i, ii, colored, pl. xii, half-tone.

² A Fauna of the Tay Basin & Strathmore. By J. A. Harvie-Brown. Edinburgh, David Douglas, 1906—Small 4to, pp. i–lxxxvi + 1–377, 21 photogravure plates, 8 text cuts, and 6 maps. Price 30 shillings.

the preface is 'A Short Revision of the past Volumes of this Series' (pp. xvii-xxi), and this is succeeded by 'Annals of the Perthshire Society of Natural Science,' by the president of the Society, Henry Cootes (pp. xxii-xxviii). The next sixty pages are devoted to a detailed account of the topography of the Tay Basin, which comprises a larger area than any other river system in Scotland, comprising "some 3250 square miles. The physical, faunal and floral features of its mountains, glens, and lochs are given at length, with especial reference to their ornithology. The influences governing the dispersal of species, especially in Scotland, are also considered. In the main text of the 'Fauna' the mammals occupy about sixty pages, the birds about three hundred, and the reptiles and Amphibia about six.

The fauna of the higher parts of Scotland has a decidedly arctic tinge, through the presence in the breeding season as such birds as the Wheatear, Snowflake, Ptarmigan, Red-necked Phalarope, Whimbrel, Greenshank, Skua, Black-throated Loon, Fulmar Petrel, and various northern breeding ducks.

As Mr. Harvie-Brown is not a 'splitter,' it is of interest to note that he is able to recognize "three fairly distinct phases of coloration [in the Song Thrush (*Turdus musicus*)] in Scotland alone, viz.: the very dark insular and western form universal in the Outer Hebrides; the ordinary olive-backed bird of our shrubberies and mainland hedgerows; and the very light sand coloured bird of our eastern seaboard"; these phases being due, as he believes, to the effects of climate, or of isolation and climate combined.

The number of species of birds in the Tay Basin is not stated, but the records have evidently been exhaustively examined, and notable fluctuations in the numerical representation of several species at different periods is frequently the subject of comment. Some species have sensibly increased at certain localities, while many have greatly decreased. The comparatively recent increase of the Starling, and its recent wide dispersal over parts of Scotland where it was formerly rare or unknown is noted at length. At present he says: "Except high up among the mountains and in out-of-the-way places, the distribution has become almost universal, and the time may not be far removed when the great armies will coalesce. Then, if I may continue to speak a little metaphorically — '*Then shall come the Deluge.*'"

'A Fauna of the Tay Basin' is prepared with the same care and vast amount of historic research that has characterized the previous volumes of this admirable series, with which it conforms in typographical execution, reflecting the good taste and liberality of Mr. David Douglas, the well-known publisher of this important series of faunal works. The illustrations are especially worthy of note. Eight of the photogravure plates are portraits of local naturalists of note; others show the nests or the nesting haunts of birds, or illustrate characteristic or interesting scenic features. The text illustrations are also photogravures and mostly views of lochs or

cliffs. The maps illustrate the invasion of the Little Auk in 1894-95; the dispersal of the nesting of the Starling and of the Tufted Duck, the Firth of Tay and adjoining region, and there is a general map of the Tay Basin and Strathmore, shaded to show relative elevation of the country.—
J. A. A.

CORRESPONDENCE.

The Concilium Bibliographicum as a Bureau of Ornithological Information.

TO THE EDITORS OF 'THE AUK':—

Dear Sirs:—The Concilium Bibliographicum was founded in 1895 by the International Congress of Zoölogy for the purpose of recording in a permanent way all notices regarding zoölogy published since 1896. Every paper is entered on a bibliographical card, usually with a short statement of the contents, and these cards are most minutely classified. Thus a paper on the Limicolæ of Michigan, with notes on nesting and observations on albinism would receive four entries, Limicolæ, Fauna of Michigan, Nesting, and Coloration. If the paper contained descriptions of new forms, each of these would be noted on a separate card. The cards relating to new species are not as yet printed; but the others are supplied in any desired combination, *e. g.*, cards on the Fauna of Michigan, on Nesting or Bird-song, on Migration, on Coloration, or references to a given group of birds, as Limicolæ or Parrots.

A large portion of the expense of maintaining the Concilium is defrayed by the Swiss government. There is, however, a fee charged for every set of references, depending on the number of cards supplied. Soon after its foundation the Concilium was universally recognized as the central agency of the whole world for such work, and to-day there is no country participating in the scientific movement that does not receive cards, the total number annually distributed aggregating nearly one million.

There are, however, certain strange anomalies in the participation of various constituencies. The most singular fact is that American *ornithologists* have remained aloof. This circumstance paralyses all our efforts at improving this section of the work. We can not feel justified in attributing any large portion of our subsidies for preparing lists that are not used. Nevertheless, with the positive conviction that this is only a transient feature, we have for over ten years never wavered in prosecuting

the work in ornithology. Yet how discouraging it is to day by day file away references to the avifauna of each State in the Union, when the information thus collected with endless pains is never used! That there are imperfections in our work has been inevitable; but the only way to remedy these is for us to come into closer relations with American ornithologists, whom our organization is designed to serve.

I wish to lay this matter before the A. O. U. with the hope that a means may be found for securing the support of the Union and its members. It would be especially pleasing if the A. O. U. could appoint a committee to coöperate in making our work more serviceable.

Respectfully,

HERBERT HAVILAND FIELD.

[It may be added, for the information of our readers, that the American Museum of Natural History, of New York, is a volunteer agency for the distribution of the cards of the Concilium, through which institution they may be ordered. As the cards are held in stock, orders can be filled without delay. They may also be ordered through Edward S. Field, 427 Broadway, New York City.—EDD.]

NOTES AND NEWS.

WILLIAM THOMAS BLANFORD, an Honorary Fellow of the American Ornithologists' Union, died at his residence in Bedford Gardens, Campden Hill, London, on June 23, 1905, at the age of 72 years. Dr. Blanford was an eminent worker in other fields of scientific research as well as in ornithology. His explorations in Abyssinia, Persia, the Peninsula of India, the Himalaya, and other portions of Central Asia, as a geologist, a physical geographer, and zoölogist, gave him a wide range of experience, which fitted him to deal authoritatively with the problems of zoögeography, to which subject he made important contributions, especially as to the faunal subdivisions of the Oriental Region. He published many papers on mammals, reptiles, and mollusks, as well as on birds. He was employed for many years on the Geological Survey of India, to which he was appointed in 1855, and from which he retired in 1882.

His ornithological papers relate mainly to the birds of India, and were published at intervals from 1867 to 1894; he was also the author of two of the bird volumes (Vols. III and IV) of the 'Fauna of British India' (of which seventeen volumes have appeared), of which great work he was the editor. Among his other principal works are: 'Observations on the Geology and Zoölogy of Abyssinia' (1870; birds pp. 285-443); 'Eastern Persia: an Account of the Journeys of the Persian Boundary Commission, 1870-72' (birds, pp. 98-304); 'The Distribution of Vertebrate Animals

in India, Ceylon, and Burma' (Proceedings of the Royal Society of London, Vol. LXVII, 1901, pp. 484-492). The later years of his life were spent in London, in scientific research, where he served also on the Councils of the Royal, Geological, Geographical, and Zoölogical Societies.

SIR WALTER LAWRY BULLER, a Corresponding Fellow of the American Ornithologists' Union, died at Fleet, in Hampshire, England, July 19, 1906, at the age of 68 years. He was born in New Zealand in 1838, where he spent most of his life; he was a lawyer by profession, and held, at different times, several government commissions. He became early interested in birds, and was long recognized as the chief authority on New Zealand ornithology, to which his ornithological writings mainly relate. His 'History of the Birds of New Zealand' (1 vol., 4to, London) was published in 1873, followed by a second edition (2 vols., 4to) in 1887-88, and a 'Supplement' (2 vols., 4to) in 1905-06. He also published a 'Manual of the Birds of New Zealand' (8vo, Wellington) in 1882; and many papers in 'The Ibis,' the 'Proceedings' of the Zoölogical Society of London, and the 'Transactions' of the New Zealand Institute. He was also a good ethnologist, and made contributions to other branches of natural history.

THE A. O. U. Committee on the revision of the Code of Nomenclature presented its report to the Council during the recent session of the A. O. U. Congress held in Washington, November 13-16, 1906. After considerable discussion the report of the Committee was adopted; on only one provision was there much diversity of opinion, either in the Committee or in the Council. This was in relation to the determination of types of genera, in reference to which the Committee submitted majority and a minority reports, the majority report being the one adopted by the Council. This was to the effect that where the types of polytypic genera are not specified by the founder of the genus, and are not determinable by the principle of tautonomy, the first species mentioned as belonging to the genus is to be taken as its type. To avoid too great confusion from a universal enforcement of a 'first species rule' for such cases, the Linnæan genera were exempted from its application. The minority report of the Committee favored the continued use of the so-called 'elimination method,' or the application of the rule of priority. In other respects the old A. O. U. Code is not materially changed, the various amendments introducing no new principle, nor reversing any former ruling; they simply amplify and render more explicit such canons as were open to doubtful interpretation in respect to their full scope and intent.

The Committee on the Nomenclature and Classification of North American Birds submitted a report of progress, showing that the work of preparing the new edition of the Check-List was well advanced, but that much still remained to be accomplished before the manuscript could be given to the printer. A meeting of this Committee was held after the adjournment of the A. O. U. Congress, at which all of the then remaining details

as to the scope and form of the new Check-List were decided, as well as quite a number of cases of nomenclature and the status of forms. The Committee adjourned to meet again in April, to complete the work still in hand.

THE second annual meeting of the National Association of Audubon Societies was held at the American Museum of Natural History in New York City on October 30, 1906. The Treasurer's report showed that the receipts for the year had been \$8,773.67, and the expenditures \$9,316.95, showing a deficit of \$523.54, notwithstanding the utmost economy in administration. Seventeen life members were added during the year, and the fees therefrom added to the endowment fund. The report of the subcommittee of the Board of Directors appointed to complete the negotiations relative to a settlement of the residuary interest of the Association under the will of the late Albert Willcox (see Auk, XXII, Oct. 1906, p. 486) stated that a settlement had been effected whereby the sum of \$231,072 had been acquired by the association. This makes the total legacy of \$331,072 from the will of the late Albert Willcox available for the work of the Association. The following were elected Directors to serve for the term of five years: Frank Bond, of Wyoming; T. Gilbert Pearson, of North Carolina; Mrs. Elizabeth B. Davenport, of Vermont; J. A. Allen, of New York; David Starr Jordan, of California.

The President, in a verbal address, gave a brief account of the work accomplished during 1906; the report, in full, is printed in the November-December issue of 'Bird-Lore' (Vol. VIII, No. 6, pp. 225-284). Referring to the bequest above mentioned it says: "...during the past year, by the magnificent beneficence of one of our members, the late Albert Willcox, the Association has been changed from a weak and struggling Society to a permanent and strong organization with a substantial endowment fund." The report reviews in detail the work of the year, and, as usual, is a document of great ornithological interest aside from the feature of bird protection.

IMPORTANT CHANGE OF ADDRESS.—Members of the A. O. U. and subscribers to 'The Auk' should note the change of address of the Treasurer, given on the second page of the cover of this issue, namely: Dr. Jonathan Dwight, Jr., **134 West 71st Street**, New York City.

Avicultural Magazine, Oct.-Dec., 1906.

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(Continued on 3rd page of Cover.)

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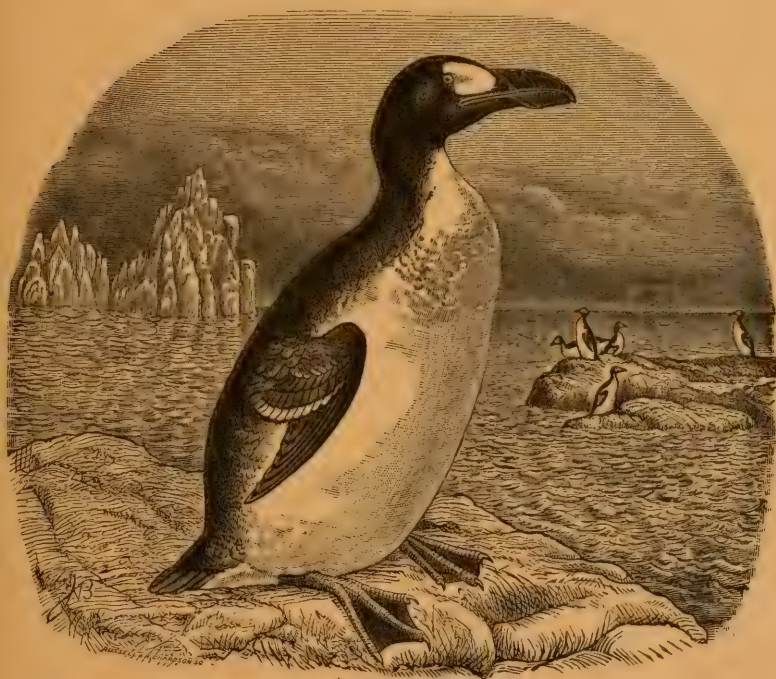
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CONTENTS.

	PAGE
ORNITHOLOGICAL CONDITIONS IN NORTHEASTERN ILLINOIS, WITH NOTES ON SOME WINTER BIRDS. By John F. Ferry	121
THE PRESENT STATUS OF THE ENGLISH SPARROW PROBLEM IN AMERICA. By A. H. Estabrook	129
RECENT ORNITHOLOGICAL DEVELOPMENTS IN SOUTHEASTERN MICHIGAN. By B. H. Swales and P. A. Taverner	135
THE BEWICK WREN IN THE DISTRICT OF COLUMBIA, WITH A DESCRIPTION OF ITS SONG. By Arthur H. Howell and Henry Oldys	149
CONCERNING CERTAIN SUPPOSED INSTANCES OF THE OCCURRENCE OF THE CINNAMON TEAL IN FLORIDA AND SOUTH CAROLINA. By William Brewster	154
ADDITIONAL NOTES ON THE BIRDS OF LEON COUNTY, FLORIDA. By R. W. Williams, Jr.	158
THE MARBLED GODWIT ON ITS BREEDING GROUNDS. By A. C. Bent. (Plate III.)	160
A HYBRID GROUSE, RICHARDSON'S + SHARP-TAIL. By Allan Brooks. (Plate IV.)	167
ASPECTS OF BIRD DISTRIBUTION IN LOUISIANA AND MISSISSIPPI. By Henry H. Kopman	169
UNUSUAL ABUNDANCE OF THE AMERICAN GOSHAWK (<i>Accipiter atricapillus</i>). By Ruthven Deane	182
NOTES CONCERNING CERTAIN BIRDS OF LONG ISLAND, N. Y. By William C. Braisted, M. D.	186
SOME CHANGES IN THE CURRENT GENERIC NAMES OF NORTH AMERICAN BIRDS. By Wilmer Stone	189
A CARD SYSTEM OF NOTE-KEEPING. By A. H. Felger	200
NOTES ON THE BLACK RAIL OF CALIFORNIA. By William Brewster	205

GENERAL NOTES.—The Black Tern at Philadelphia, Pa., 211; Ross's Snow Goose in Colorado, 211; The Whistling Swan at Martha's Vineyard, Mass., 212; Whistling Swan (*Olor columbianus*) in Massachusetts, 212; *Ardea egretta* in New Mexico, 212; Late Occurrence of the King Rail (*Rallus elegans*) in Wisconsin, 212; The Stilt Sandpiper—a Correction, 213; The American Rough-legged Hawk Breeding in North Dakota, 213; The Pigeon Hawk in Wayne Co., Michigan, 214; The Goshawk in Montgomery Co., Virginia, 214; The Barn Owl in Massachusetts, 214; Great Gray Owl (*Scoiapterx nebulosa*), 215; Great Gray Owl (*Scoiapterx nebulosa*) in Rhode Island, 215; Aggressive Screech Owls, 215; The Snowy Owl (*Nyctea nyctea*) not generally abundant in the Winter of 1906-1907, 217; Identity of *Tyrannula mexicana* Kaup, 219; White-winged Crossbill at Raleigh, N. C., 220; *Loxia curvirostra minor* in Florida, 220; The Vesper Sparrow on Long Island in Winter, 220; Malformed Bill of Rose-breasted Grosbeak, 220; Breeding of the Rough-winged Swallow in Berkshire County, Mass., 221; Another Connecticut Warbler from Maine, 222; The Blue-gray Gnatcatcher in Massachusetts, 222; Two Interesting Nebraska Records, 223; Autumn Records of the Golden Plover and Lapland Longspur in Wayne Co., Mich., 223; Notes from Western New York, 224; Notes on the Ornithological Works of John James Audubon, 226.

RECENT LITERATURE.—Chapman's 'The Warblers of North America,' 227; Alphéraky's 'The Geese of Europe and Asia,' 229; Oberholser on Birds from East Africa, 230; Schiebel on the Phylogeny of the Species of *Lanius*, 230; Hellmayr on the Types of Little-known Neotropical Birds, 231; Hellmayr on the Birds of Pará, Brazil, 231; Wood's Twenty-five Years of Bird Migration at Ann Arbor, Michigan, 231; Montgomery's 'The Protection of Our Native Birds,' 232; Oberholser's 'The North American Eagles and their Economic Relations,' 232; Cooke's 'The Distribution and Migration of North American Ducks, Geese, and Swans,' 232; Ward's 'Notes on the Herring Gull and Caspian Tern,' 233; Game Laws for 1906, 234; Forbush's 'Useful Birds and their Protection,' 234; Dionne's Birds of the Province of Quebec, 236; Clark's Birds of Amherst, Massachusetts, 236; Cole on Birds from Yucatan, 237; Proceedings of the Delaware Valley Ornithological Club, 237.

NOTES AND NEWS.—Obituary: August Koch, 238. 'The Warbler,' 239; 'American Ornithology,' 239; Ornithological Section of the Seventh International Congress, 239; Australian Ornithologists' Union, 240.

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ORNITHOLOGICAL CONDITIONS IN NORTHEASTERN ILLINOIS, WITH NOTES ON SOME WINTER BIRDS.

BY JOHN F. FERRY.

IN THE extreme northeastern corner of Illinois lies a region of unusual interest to the ornithologist. Between the years 1853 and 1873 it was thoroughly explored by Robt. Kennicott, E. W. Nelson, and F. T. Jencks, as well as by resident ornithologists, and it has furnished many an interesting bird note for northern Illinois. Of late years it has been almost totally ignored, possibly through the natural supposition that the rapid settlement of the surrounding country had completely changed its character. As a matter of fact, it remains to-day essentially in its primitive condition. The cause is obvious; the land is practically worthless save for one purpose, that of manufacturing sites. In all probability many years will elapse before the thriving industries of Waukegan, the county seat immediately south, will occupy the whole region. Two causes, one for the better, the other for the worse, have made such changes as now exist. The one is the marked improvement of the land through the planting of trees, the other is the partial draining of the swamps. The former is one of great interest, not alone to the ornithologist but to the forester and horticulturist as well. The propagation of many varieties of forest trees was carried on by some local nurserymen on such an extensive scale and in so intelligent a manner that it created a wide interest among nurserymen generally and among those who had the problem to solve of beautifying or reclaiming from practical

worthlessness large areas of barren, sandy, or otherwise sterile regions.

The proprietor of the R. Douglass Son's Nursery, Waukegan, was the one who carried on this praiseworthy work. An added element of interest in the present connection is that the sons of the proprietor, then young men, were all active ornithologists. They furnished many valuable notes to the ornithological writers of that time, and it gives me pleasure to again bring to notice the name of Mr. Thomas H. Douglass, a collecting companion of E. W. Nelson, who has kindly given me the early history of the region herein described. This project of reforestation included the purchase of over 600 acres of sandy barren land in 1873, and the planting thereon during the succeeding 15 years or so, of over 200,000 trees. The following species were represented: balsam fir (*Abies balsamea*), balsam fir (*Abies fraseri*), Norway spruce (*Picea excelsa*), white spruce (*Picea alba*), Norway pine (*Pinus resinosa*), white pine (*Pinus strobus*), Scotch pine (*Pinus sylvestris*), Austrian pine (*Pinus austriaca*), Swiss mountain pine (*Pinus mughus*), table nut pine (*Pinus pingeus*), European larch (*Larix europea*), American larch (*Larix americana*), arbor-vitæ (*Thuja occidentalis*), yellow birch (*Betula lutea*), black birch (*Betula lenta*), catalpa (*Catalpa speciosa*), red ash (*Fraxinus pubescens*), white ash (*F. americana*), green ash (*F. viridis*), mountain ash (*Sorbus americana*), European alder (*Alnus glutinosus*), chestnut (*Castanea dentata*), beech-nut (*Fagus americana*), walnut (*Juglans nigra*), hickory (*Hicoria* sp?), and several species of oaks (*Quercus*). The work was done with surprisingly little expense. The surplus of each year's nursery supply was taken to the spot, and the seedlings placed in narrow furrows made with the plow in the damp sand. Here the successful species grew with little further care. The experiment proved an interesting illustration of the survival of the fittest. Most of the species tried died, but, profiting by experience, the experimenters planted during the succeeding years only the hardier varieties. The result to-day, after 30 years have elapsed, are two long tracts of sturdy Scotch pine, with an occasional European larch, or white pine. This artificial forest is one of absorbing interest to the ornithologist. It stands conspicuous in the desolation of marsh and sand dune, and is unique in a region where

native conifers are almost entirely absent. Here migrants and winter visitants find an ideal feeding ground and a haven of rest.

A brief description of the region may be of interest. It extends from the city of Waukegan due north for about six miles. It is a low, sandy waste of dunes and ridges, the latter running northeast parallel to the shore of Lake Michigan, and varies from one half mile in width at its southern end to one and a half to two miles at the northern extremity. Before being partially drained, much of the region was water, occurring in the forms of a wide, shallow pond and two 'dead' rivers. These latter were channels from twenty to thirty rods in width, and without natural outlet. These channels and the pond were continuous and formed a natural waterway extending north and south almost the entire length of the region. Small tributary sloughs entered this larger body. Most of the region is less than ten feet above the lake and only in cases of high water did these confined waters break through a narrow spit and flow into the lake. The dunes and ridges are covered with two species of Juniper (*Juniperus communis* and *J. sabona* var. *procumbens*), sand berries (*Arctostaphylos uva-ursi*), huckle-berries (*Gaylussacia resinosa*), dwarf alder (*Alnus serrulata*), white birch (*Betula populifolia*), and with occasionally white pines and poplars. In its more northern portion are ash, wild raspberries (*Rubus strigosus*), and black oaks (*Quercus velutina*). The western boundary of this region is 'the bluff,' a characteristic feature of the shore of Lake Michigan in this locality. Here it is heavily wooded with a fine hardwood forest of walnut, hickory, various oaks, and the red and sugar maple (*Acer rubrum* and *A. saccharum*).

This region received the writer's close attention during the fall of 1906, weekly visits being made during September, October, and November. This season appeared to be one of remarkable ornithological interest, as the following list of winter visitants will show. Most of the birds were found among the dense pines above described.

The following notes were taken while collecting for the Field Museum of Natural History.

Euphagus carolinus. RUSTY BLACKBIRD.—Specimens were taken at the lake shore on January 22, feeding in a corn field, the first winter record of this species for this region.

Hesperiphona vespertina. EVENING GROSBEAK.—A flock of seven of these interesting and erratic birds was observed on November 10 in Waukegan by Mr. C. W. Douglass. They were feeding on the seeds of a box elder growing along one of the city streets. On November 18 they were observed in practically the same spot, and on this same date Mr. H. K. Coale saw two males and five females feeding on a maple in Highland Park. He also reports that a flock of seven are still (Feb. 7) in Highland Park, feeding on maple seeds, etc., in private grounds. He again saw two birds about December 1 in the same locality. Mr. F. S. Daggett saw two birds at River Forest on Christmas Day, and the writer heard one calling in the same locality on January 13. These birds have been seen in Lake Forest three or more different years, occurring in large flocks. They showed a great fondness for willow buds, and also frequently fed upon the ground, where the entire flock could be seen working industriously among last year's fallen leaves. They would usually remain till late in the spring, when they would depart in a body.

Pinicola enucleator leucura. PINE GROSBEAK.—This species was presumably seen on November 9 and an immature specimen was taken on November 17. It was accompanied by another immature bird at the time. They were found in a thick clump of pines and were moving quietly among the lower branches. They occasionally uttered their low call-note. The following day six birds were seen in Lake Forest, a suburb ten miles to the south. They were feeding on the dried fruit of ash and maple trees. No brilliantly colored males were seen in this flock. They were inclined to be wary when in the flock, but when feeding singly, one could almost stand beneath the tree where the bird was. The birds called to one another frequently, and if really alarmed, the scattered birds would soon gather and the assembled flock would fly off together uttering their clear musical whistle. The birds were next seen on the 25th of November, and a flock of Grosbeaks, presumably of this species, was seen the last of December or the first of January. This flock may follow the habit of previous ones and remain within the park-like city of Lake Forest for the winter.

Carpodacus purpureus. PURPLE FINCH.—The Purple Finches

were first observed on August 27, and were repeatedly observed during September, October and November, at times being quite abundant. They are a regular winter resident in this locality and show a decided fondness for the seeds of the horn beam. Barberry and other fruit-bearing shrubbery is also a favorite resort of this bird.

***Loxia curvirostra minor.* AMERICAN CROSSBILL.**

***Loxia leucoptera.* WHITE-WINGED CROSSBILL.**—The abundance of Crossbills — both species — was perhaps the most interesting feature of this season's bird-study. On October 6 both species were taken, flocks of 10–15 of each kind being observed. They were found in the thick pines, and they made the area grown with these trees resound with their penetrating, metallic notes. These birds must have been continually present from October 6 until December 25 when one bird was seen. They were seen on each of weekly trips made during October and November and at times were extremely abundant, their clear, high-pitched calls being heard almost constantly. The White-winged Crossbills possibly outnumbered the red variety, two to one. Their distribution in the vicinity of Chicago seems to have been very general, as one or both species has been reported from Jackson Park, Chicago, Glen Ellyn, River Forest, and Lake Forest. In the latter place on October 28, several large flocks, one of them numbering about 40 individuals, were seen flying restlessly about private grounds where conifers were abundant. A few detached individuals were frequently observed to suddenly halt their flight overhead and drop into the top of a tall spruce, where they seemed to vanish completely. After a short lapse they would start calling, and then, if they did not suddenly take flight, they would be seen moving like miniature parrots, along the branches in search of cones. The note of the White-winged Crossbill somewhat resembles the call of the Pine Siskin, but it is much magnified in tone and volume. When calling to each other the note has a sharp, strident quality, which the observer can quite easily imitate by giving short, sharp, quick whistles. By this mimicry a flock passing overhead can frequently be lured into the top of the tree beneath which the observer stands. The wariness exhibited by both species varies greatly with circumstances. At times a flock

will alight in the leafless branches of a tree-top, from which they will take flight at the first sign of danger. At other times the observer may approach a low spruce tree in which they are feeding and only with great difficulty can they be dislodged. The white-winged species seems much more disposed to feed upon the ground than its congeners. They are fond of juniper berries and this fall Mr. R. J. Douglass observed them feeding on dried sun-flower seeds, which were still embedded in the withered flower. At the Douglass Nursery a few years ago the White-winged Crossbills appeared in the early spring and descended upon seedling conifers in such numbers that the birds were systematically shot. The Crossbills appear to migrate in large flocks and when a favorable locality is found they scatter in small flocks of a dozen to three or four individuals. When thus scattered it is not uncommon for a lone one to shoot down out of space, and make the place resound with its clear, penetrating calls, which at such times seem to possess an anxious or frightened quality. A friendly call of one of its kind will send the straggler hastily thither. The White-winged Crossbills exhibited an almost endless variety of plumage. The highly colored male birds were comparatively few, being far outnumbered by the females and immature birds in nearly every stage of juvenile plumage. Some young birds resembled the female Red-winged Blackbird (*Agelaius phoeniceus*), and from this degree of plainness a very interesting case of varied coloration was seen. These two species of Crossbill frequently intermingle. All specimens of these species taken this fall were exceedingly fat.

Acanthis linaria. COMMON REDPOLL.—The Redpolls were first observed on November 9, and were abundant at that time. They were first seen in flocks of 25 or more but later divided into smaller companies, some of them joining bands of Goldfinches and Siskins. In closely assembled flocks they alight in a patch of weeds and feed upon the seeds. They work industriously and in perfect silence. Their note, a cheery, plaintive, canary-like call, has a singular sweetness when it is the only bird melody of a bleak winter day.

Spinus pinus. PINE SISKIN.—On September 30, the first Siskins were seen, when a flock of about 15 flew over Lake Forest. Their plaintive, rasping note makes them easily distinguished

while on the wing. Several times a large flock of Siskins were seen to alight on the top branches of a low pine and fairly cover it, like a swarm of bees. Unlike the Crossbills they were observed to feed industriously on coneless branches of pines and spruces. The object sought was probably the dry resinous aments of these conifers. They frequent patches of thistle and seed-bearing weeds and work very actively and in perfect silence. They decoy readily to an imitation of their note, and will alight fearlessly within a few feet of the observer. The specimens secured were in excellent condition, quite fat, and the immature birds formed a large proportion of every flock.

Passerina nivalis. SNOWFLAKE.—A flock of six Snowflakes were seen October 28 on the wide, sandy beach at Lake Forest. From the high bluff overlooking, they could be seen running rapidly from one scanty tuft of grass to another. On November 5, while the writer and a companion were out on Lake Michigan in a row-boat, a small white bird suddenly appeared out of the enveloping haze and passed within three oar-lengths of us. It was clearly identified as a snowflake. These birds were seen again on the 9th of November, and were last seen at Jackson Park on December 15. They are locally a common winter resident here. When alarmed they quickly take flight, and they have an interesting habit of returning to the spot from which they were frightened, after having apparently vanished.

Calcarius lapponicus. LAPLAND LONGSPUR.—Longspurs were very abundant this fall. On November 5, a flock of birds uttering the familiar longspur note passed overhead flying due south. Similar flocks were observed on the 9th and 17th, and on the 18th four or five large flocks flew in a northeasterly direction, over the Government Pier at Waukegan, which extends three or four hundred yards into the lake. It is reasonably certain that a large majority of such flocks were composed of *C. lapponicus*, as *C. pictus* is irregular and not common in this region while *lapponicus* is just the reverse. The latter often occur in vast flocks. The extensive low prairies south and west of Chicago are a favorite resort of this bird.

Calcarius pictus. SMITH'S LONGSPUR.—A flock of forty of this species was observed on November 29 by Gerard A. Abbott on the Golf Links at Jackson Park. He flushed them three times, getting

within a few paces of them. They are not a common bird in this vicinity.

Zonotrichia albicollis. WHITE-THROATED SPARROW.—On January 24, while hunting for winter birds on the beach, I captured four adult specimens of this species. The day was very cold (1°–10° above zero) with a high northwest wind. This is the first known occurrence of this species here in winter.

Cardinalis cardinalis. CARDINAL.—A pair of these birds were observed on January 13, at River Forest. They are not a common bird here at any season. The spot where they were seen was on the Desplaines River, and they are usually encountered along the heavy timber and underbrush of several rivers in the vicinity which make convenient highways from the center of their abundance in the central and southern portion of the State. Mr. Frank Gates of Chicago reports one seen on the Desplaines River, west of Chicago, on December 24, and one seen in Graceland Cemetery, Chicago, on the 25th and 29th of December and on January 1.

Lanius borealis. NORTHERN SHRIKE.—These birds are of regular occurrence here in the winter. One was seen this year on October 12 at Jackson Park, and specimens were taken on October 25 and November 9. On the latter date a half-eaten White-winged Crossbill, impaled on a dead pine branch, was observed, and the abundance of small birds in the heavy pines, doubtless was a strong attraction to the shrikes.

Ampelis garrulus. BOHEMIAN WAXWING.—The arrival of this irregular winter visitant had been eagerly watched for, when on November 22 Mr. T. H. Douglass saw a flock of ten clustering on his small spruce trees and later feeding on barberry bushes close by. Two were seen by H. S. Swarth about Jackson Park, Chicago, February 2–7, feeding on barberries, and one was taken on the 7th. These birds have often been observed in this locality, they sometimes occurring in immense flocks. Their appearance, however, is very uncertain. They sometimes seek the deep woods for shelter, but they feed more in the open country, where berries and seeds still cling to the shrubbery and trees.

Penthestes hudsonicus. HUDSONIAN CHICKADEE.—This bird was first met on November 5¹ in a heavy clump of pines, where

¹ As mentioned, without definite data, by F. M. Woodruff in 'The Auk' for January, 1907, p. 107.

its little scolding note was several times heard before the bird itself was captured by the writer. On the 8th two more specimens were captured. On November 10 a single bird was observed in Lake Forest, hopping in a lively manner in a small apple tree. It showed no fear and several times could have been touched with a walking stick. These four specimens, occurring in localities ten miles apart, might suggest a rather general occurrence of these rare stragglers from the north. The only other occurrence of this bird in Illinois, was when Dr. Velie observed it at Rock Island subsequent to 1852. Mr. Wells W. Cooke informs the writer that the bird taken on November 5 may safely be considered the second record for the State.

THE PRESENT STATUS OF THE ENGLISH SPARROW PROBLEM IN AMERICA.

BY A. H. ESTABROOK.

THE English Sparrow (*Passer domesticus*), was introduced into the United States in the fall of 1850. The first few pairs were liberated at Brooklyn, N. Y. In the few years then following, many others were liberated at different cities in the United States, so that by 1875, they had spread over practically the whole area east of the Mississippi. From the time of its introduction, there was a storm of protest from the practical naturalists who foresaw the result of its introduction, from its behavior in other countries. They knew its record in countries where it had been a longer resident. The people who introduced the sparrow believed that it would be an insectivorous bird, and would take care of the canker worm which was then troubling the people very much. The canker worm is no longer a pest, but its destruction by the sparrow is not granted by the ornithologists. E. H. Forbush, in his report on the Gypsy moth states that the sparrow has been

seen to eat all forms of the moth, but that the bird itself is more injurious than beneficial inasmuch as the sparrow drives away the native birds which would hold the pest in check. Dr. Elliott Coues made, in 1880, an urgent appeal to the people to exterminate the English Sparrow for the following reasons.

1. They do not perform the work for which they were imported.
2. They attack, harass, fight, drive away, and kill native birds, much more insectivorous than themselves.

In 1889 the United States Department of Agriculture published a 400-page volume on the English Sparrow in America. This work takes up the economic status of the English Sparrow, its food relations, and its behavior with other birds. An amazing amount of evidence against the sparrow is gathered here and the author of the bulletin advises the extermination of the sparrow all over the United States.

In April, 1906, the following questionnaire was printed in these publications; 'The Auk,' 'Bird-Lore,' 'American Bird Magazine,' 'The Oologist,' and 'Maine Sportsman.'

Circular of Inquiry with Reference to the Present Status of the English Sparrow Problem in America.

1. Are you familiar with Bulletin No. 1, The English Sparrow in America, published by the Agricultural Department in 1889; and do you agree with the facts there presented and with its conclusions?

2. Are English Sparrows present in your locality? If so, are they increasing or decreasing in numbers?

3. What is being done with you to exterminate them? Please outline methods which you deem effective.

4. What influence have you observed the English Sparrow to have upon native birds?

5. Would public opinion in your locality favor the adoption of effective measures to exterminate the species?

6. Please state the facts and arguments, pro and con, which decide this problem in your own mind. Please send replies as early as possible — before June 1 — to the undersigned. It is hoped to gather a consensus of opinion from all parts of this Country and Canada. The data will be published as soon as possible.

Signed,

March 5, 1906.

A. H. ESTABROOK,
Clark University, Worcester, Mass.

From this questionnaire and from letters sent out by me personally, I have received about eighty answers. I also wrote to all

the Experiment Stations in the United States, and to prominent ornithologists in Canada. These answers practically all agree that the English Sparrow is an obnoxious bird to have, especially to our native bird population. Several letters state that we have no right morally, to kill the English Sparrow, or any other living creature. But it must be plain to anyone that we have as much right to kill a bird that is generally considered obnoxious, as we have to kill mice, rats, fleas, mosquitoes, bedbugs, and the like. This standpoint of false humanitarianism is derided in most emphatic terms in many of my letters.

I will take up the questions in the order in which they appear in the enquiry, and will endeavor to give the main results secured by the questionnaire.

1. Are you familiar with Bulletin No. 1, etc. This was inserted in the questionnaire to see if the bulletin referred to, had, to any great extent, been circulated through the country, and also to see if it had had any marked effect on the ideas of the people in regard to the sparrow. A good portion had seen the bulletin and most of those agreed with it perfectly.

2. Is the English Sparrow present in your locality? Increasing or decreasing?

The data for the distribution of the sparrow I have secured from the Directors of the different Experiment Stations, and from the prominent ornithologists in Canada. The English Sparrow exists in enormous numbers in the whole region east of the Rocky Mountains; with the exception of Florida, where it is found in a few places, and in Texas, Oklahoma, and the northern part of Montana where it is reported absent. West of the Rockies, he is reported in Utah, Colorado, and in and about San Francisco, and Portland, Oregon. It is found throughout Canada, south of latitude 50°, and as far west as the Rockies. It does not seem to be either increasing or decreasing its numbers to any appreciable extent anywhere in this area.

3. What is being done with you to exterminate them? Outline methods.

In a great many localities, much is being done towards extermination; nearly one half of those answering were doing something to hold them in check, but as these few are scattered throughout

the country, no lasting, permanent effect is secured. The methods used are mostly that of poisoned grain, destroying nests and young, and shooting.

4. What influence have you observed the English Sparrow to have upon native birds?

The influence of the sparrow upon native birds is the crucial point in this discussion. It is not a question of how many insects it eats; it is whether our native birds would be better off without the intruder or not. There were two people, who liked to see the bird about in winter, when the other birds were away. A larger number honestly believed that the bird was doing a good service in the eating of weed seed. These few, however, admitted that the English Sparrow did attack and harass other birds. The rest of the letters were against the sparrow. Many give personal experiences of the sparrow's pugnacity and plead for a sure and certain method to get rid of the species. Others are up and doing and are killing off thousands each year, by poison and the gun. I will quote here three extracts:

"I have frequently observed that the English Sparrow chased the Robins off the State College Campus (Harrisburgh), and last year at my residence on the Penn. State Collegé, I saw a male sparrow kill and drop from the nest four young Pewees, about a week or two old. The parents which are recognized as being among the most insectivorous birds, were entirely helpless in the presence of the intruder and destroyer of their young." — *H. H. Surface*, Pa.

"Have seen them rob Bluebirds' nests, drive away Robins, Wrens, and Crested Flycatchers." — *H. Link*, Indiana.

"The Purple Martins long disputed the possession of their boxes with the sparrows but eventually were compelled to give them at least half the compartments in each box. The Swallows and Bluebirds were driven out nearly altogether for many years, but of recent years have made increased use of the boxes. The Purple Martins are practically gone, and I doubt if the Bluebirds or Swallows would be allowed to nest, if the sparrows occupying the boxes were not turned out and their nests destroyed, as I have been in the habit of doing." — *James H. Fleming*, Toronto, Ontario.

5. Would public opinion in your locality favor the adoption of effective measures to exterminate the species?

Public opinion, in many localities, would favor extermination, but in many places, so-called humanitarians were, and are, still bitterly opposed to sparrow destruction, as in Boston in 1889. But the greater portion of the letters report communities to be entirely indifferent, and difficult to arouse to any definite action. As is always the case, a pest must become overwhelming, before the general public will pay the slightest heed.

6. State facts and arguments, pro and con, which decide this problem in your own mind.

Two letters used the argument that it was cruel to kill any living thing, no matter how good the reason, basing it on the point that the other animals had as much right to live as we had. It was also wrong to teach boys to kill things as it made them cruel. The great majority of writers were thinking of the great danger to our native birds, and this was a sufficient cause to demand extermination.

In Canada the consensus of opinion is the same as in the United States. But there the winters are more severe and so the bird does not attain to so great numbers but shows there, as here, the same fighting qualities that have made him most inimical to our native species.

There are several methods of extermination feasible; destroying nests and young, shooting, and by poisoning. The poisoned grain is prepared by dissolving one grain of strychnine sulphate in one half pint of boiling water. Pour this while hot over two quarts of cracked corn or wheat, stirring well until all the liquid is absorbed. Dry thoroughly, without scorching, and put away labelled. One kernel of this prepared grain will kill a sparrow. Great care must be used with this, and it should be used only when our other granivorous birds are away.

The English Sparrow, or House Sparrow as it is sometimes called, has been a pest in every country in which it has been introduced. At present in New Zealand the people are obliged to take the most drastic measures to exterminate them. They had become so extremely numerous that concerted action became necessary and was demanded by the people, who are now slowly exterminating them. A special officer was appointed in each county, whose sole duty it was to carry on this work. The ex-

pense is borne by a special tax levied on each county. In Australia, the sparrow is increasing to extraordinary numbers and the people are up in arms against it. As the agricultural interests there are involved, the time seems ripe for action. The sparrow is an exotic species to America, and following the law of introduced species, has become a pest and the time is sure to come when the people will demand extermination. When the whole country, or a great section of the country, comes to a definite decision in the matter, then is the time for all to work together and to clean out the species till not one is left. For if any are left, their great ratio of reproduction, four to five broods of five eggs each, each year, would soon render the work useless and leave the people more discouraged than now. The repression of the sparrow cannot be undertaken locally with any lasting or permanent effect, for the killing of a few thousands is as a drop in the bucket, and the small vacuum would soon be filled by others swarming in from neighboring parts.

The letters I have received show that some here, some there, are doing honest work toward sparrow extermination, and while I do not want in the least to discourage them in their efforts, the results are only temporary and the work must be kept up continually. If one State or group of States set to work carefully within their borders, some lasting results will be obtained and the continuous work need only be kept up on the borders of the territory where the sparrow has been exterminated. But a far better way is to have the whole country do this extermination, now, at once, and all over the United States.

RECENT ORNITHOLOGICAL DEVELOPMENTS IN
SOUTHEASTERN MICHIGAN.

BY B. H. SWALES AND P. A. TAVERNER.

NATURE means change. Nature plus man means transformation. The time is passing, and with it many of our once common species are traveling to extinction. The records of the past are fragmentary and misty and, in the light of present day conditions, the accounts of old authors are often almost past belief. Of the great flocks of water birds that once visited our waters, but an infinitesimal fraction remain and, in many specific cases, none at all. Just what the conditions were, in the old days, it is hard to tell. Game was too common, then, to be mentioned specifically; and now we can but surmise at what the great migrant hordes were composed of. Even at a later date ornithological knowledge of the rarer forms was too rare and incomplete to form the basis of modern scientific conclusion. What has been change and what misreport is but too often the problem of our list makers. The changes have been gradual and are still going on, but too often we have only awakened to the fact of the growing rarity of a species when it has utterly vanished from our horizon. Through it all, various observers have come, noted and gone; and their records have been copied and recopied and present conceptions of avifaunal conditions, in many cases, are but composite pictures of various past stages and the present. The limited opportunities most of the older observers enjoyed for the definitions of the obscurer forms, their more or less indefinite data and the loss of their specimens, also throws a veil of doubt over their records that there is now no way of piercing.

The past has gone and left but scanty record behind. Whether the present does likewise, rests with us of the present. That the next generation may not say of this as we say of the past, it seems most necessary, as various points turn up, that they should be put in an enduring form, as well for the correction of current misconception, as for a legacy to the future. To this end, the following notes have been sifted from our note books, as showing the salient

features of the past few years' work in this vicinity. Some are but formal records of occurrences, others scraps of life history or other bits that seem of more or less interest. In all cases we have given the local conditions as we have found them, taking nothing for granted that could be verified, and locating, definitely, the specimens in as many cases as possible. Eyesight records have been used but sparingly, but wherever no other are available we have attempted to give the conditions under which the identifications were made that the reader may use his own judgment as to the conclusions. It may be observed that in some cases we are at variance with lists of adjoining localities, and the reports of other observers. This cannot be helped. Our experience has been as follows and, as we have taken the utmost care in identifications, variation must be attributed to differences of locality or other reasons that suggest themselves.

The delta of the St. Clair River, known as the St. Clair Flats, has long been looked upon as that paradise of water birds where all species breed and some birds have been reported from there apparently on the principle that if not there they should be. Some of these records have been copied extensively and we have taken this opportunity to correct some of the most flagrant of them.

Larus delawarensis. RING-BILLED GULL.—There has been some doubt expressed as to the occurrence of this bird at the western end of Lake Erie (see Jones's 'Birds of Ohio,' p. 29). We have always been confident of its occurrence here and have recorded it many times in our notes. On coming to look it up, however, we were surprised to find an entire lack of actual specimens and that all our identifications had been eyesight ones. We have therefore, this fall, paid special attention to this species, with the following results: About October 15 Mr. Champion had a pair of wings that we identified as from a bird of this species taken on the river. November 1, while crossing the river, Mr. Taverner watched a small gull sailing in circles with a Herring Gull. Though it was never close enough for the characteristic ring on the bill to be distinguished, every chance was given to compare the two birds in point of size, as they crossed and recrossed each other's courses many times and often in close proximity to each other. November 12, Mr. Champion received a juvenile bird from Pine Lake, Oak-

land Co., the second county back from the river, and we examined it in his shop. On the 15th, Mr. Swales observed another on the river under similar circumstances to those above described, and about the same time Mr. Eppinger mounted another local specimen. Mr. Campion has an adult mounted bird in his window, taken several years ago, and informs us that he receives several every year from the local shooters. We regard these records as amply substantiating our claim that this species is a regular migrant on the Detroit River. It occasionally remains during mild winters.

Gelochelidon nilotica. GULL-BILLED TERN.—Reported from the Flats, but the observer now repudiates the record, and as there is no other substantiating data, it will have to be thrown out.

Sterna caspia. CASPIAN TERN.—We have no absolute data for this bird on the Detroit River, though Mr. Campion states that about October, 1901, he saw two flying up the river just out of gun range, and Mr. Fleming informs us that Mr. Maughn of Toronto has had three from the Ste. Anne's Gun Club, on the Canadian side of the Flats. At Point Pelee, at the west end of Lake Erie, in company with Mr. W. E. Saunders, May 13, 1905, we saw several beating up and down the shores with Common Terns under much the same circumstances as described under the head of Ring-billed Gull; their superior size but like coloration to their companions, made identification practically certain. On September 8, of the same year Mr. Swales observed two, in nearly the same locality, as they flew by just out of gun range.

Sterna forsteri. FORSTER'S TERN.—We have but one record of this species, a juvenile taken on the lower Detroit River Sept. 10, 1890, by J. C. Wood. This bird was identified by Mr. Robt. Ridgway and is in Mr. Swales's collection.

Sterna antillarum. LEAST TERN.—We have no evidence whatever of the occurrence of this bird in the vicinity. It is interesting to note (Auk, XXIII, pp. 452-453) that all the so-called specimens of this species that Mr. Fleming has examined from the adjoining Province have proved to be immature Black Terns. This confusion may well be the basis of our local records.

Phalacrocorax dilophus. DOUBLE-CRESTED CORMORANT.—During 1906 we have examined three specimens in the local taxidermist's shops. One, taken in April, has the breast nearly white

flecked with black, and is the second local spring record for the species. The two others were sent in from the St. Clair Flats October 1 and November 25. This seems to be about the usual number taken each year on the river and the vicinity.

Anas obscura rubripes. RED-LEGGED BLACK DUCK.—The search for this subspecies, this fall, has brought to light several that we are confident belong to the variety. The Black Duck nests regularly at the Flats and all the early fall birds belong to this breeding form. The variants do not come until November. We have unfortunately so far been unable to secure specimens for expert advice. We examined one in Campion's shop, taken December 11, that is undoubtedly a hybrid (*A. boschas* + *obscura*). This has a few slight tendencies towards the Mallard in general shape, and the coloration of the tertials. Over the eye there is a perceptible shade of green, otherwise we should call it a well marked Red-leg. It was taken in company with a typical Mallard-Black hybrid, showing about equal traces of both parents. We should judge that the before mentioned bird has about the appearance that would be exhibited by a cross between an ordinary hybrid and a Black Duck and would be well represented by the formula (*obscura* + *boscha*) + *obscura*. Both these were taken on the lower Detroit River.

Chaulelasmus streperus. GADWALL.—The Gadwall is a decidedly rare duck in this vicinity. Todd, in his 'Birds of Erie and Presque Isle,' lists it as the "rarest duck on Lake Erie." In a MS. list of birds in the Museum of the University of Michigan, date unknown, a specimen is listed with the following data: "State Survey, Southeastern Mich.—Dr. A. Sager." The bird itself has been lost and further information on it is unobtainable. Mr. Fleming informs us that Mr. John Maughn, of Toronto, has had several pass through his hands from the Ste. Anne's Gun Club, St. Clair Flats, Ont. During the past fall of 1906 we have examined three females in Campion's shop; one was taken October 26, Lower Detroit River, and the other two, November 15, Monroe Marshes, Monroe Co. One of the latter is in Taverner's collection, No. 777.

Spatula clypeata. SHOVELLER.—We have been able to find but one specimen of this species in a number of years. On October

26, 1906, a female was taken on the lower part of the river and sent to Mr. Campion to mount, in whose shop we examined it. Even twenty years ago this was considered a rare bird on the St. Clair Flats, one of the most famous ducking grounds in the country.

Aythya vallisneria. CANVAS-BACK.—We are informed by an inhabitant of Hickory Island that a small flock of Canvas-backs remained all last winter (1905–06) on the open waters of Lake Erie just off the mouth of the Detroit River.

Aythya collaris. RING-NECKED DUCK.—Though once regarded as a common duck, the Ring-neck is far from being such at present writing. Despite of keeping a close eye upon the contents of the taxidermy establishments of the city, questioning the shooters and examining their game bags at every opportunity, we have found but one local specimen, April 10, 1905, from the Flats. On November 15, 1906, we received a male from Point Pelee, Ont., which is in Mr. Taverner's collection.

Oidemia deglandi. WHITE-WINGED SCOTER.—Records of this scoter are rare enough to make it desirable to mention a male taken at Fox Island, Lower Detroit River, Nov. 22, 1906, by Mr. Atkinson. This is in Mr. Taverner's collection. This species is known among the shooters by the name of "Squaw Duck."

Chen hyperborea. LESSER SNOW GOOSE.—Since recording our opinion of this species in southeastern Michigan (Auk, XXII, pp. 219, 220), Mr. Taverner has examined several old specimens in the University of Michigan Museum that are ascribed to this section and has found that they all belong to this form. We can get no evidence that any other form has ever been taken.

Olor columbianus. WHISTLING SWAN.—It is interesting to note that, during the winter of 1905–06, a small flock of swans wintered near the western end of Lake Erie. We were so informed by a resident of Hickory Island who stated that they were very wary and noisy and kept well out in the middle of the lake. As will be remembered, the winter was very open and mild, and there was little or no ice until February. It is much to be desired that all local swans be critically examined, as there still seems to be some hope that the Trumpeter yet occurs rarely on our waters.

Ardea cærulea. LITTLE BLUE HERON.—September 22, 1906, in Leamington, Ont., we examined a mounted bird in the collection

of Mr. John Conover of that city. It was taken in September, 1904, near the base of Point Pelee by Mr. Dan Goyeau. Mr. Conover had all his things packed ready for moving to another city and the specimen was not situated so that a critical examination could be made. It was, as far as we could see, pure white, without plumes or markings of any kind. We based our identification on the color of the legs which were painted yellow. Whether this was their original color, or the taxidermist's idea of the "eternal fitness of things" there is no means of knowing. We, however, assume the former, and in that belief, place the specimen under this heading with a question mark.

Nycticorax nycticorax naevius. BLACK-CROWNED NIGHT HERON.—Though said to be a common bird on the St. Clair Flats by Langille (1883), it is now but rarely seen in this section. We have a few straggling records for the species at various points from the Flats to the Lower Detroit River, so it evidently occurs as a straggling wanderer once in a while.

Steganopus tricolor. WILSON'S PHALAROPE.—Records of this species are very rare. In addition to Taverner's record (Auk, XXIII, p. 335) and that of J. C. Wood (*ibid.*, p. 334) referring to the same place, and likely to the same individual, Mr. Campion informs us that he mounted a high-plumaged female, taken on the Flats in May, 1906, by Mr. Clarence Conely of Detroit, in whose possession it now is. It is interesting to observe that after all these years of non-observation of this species, two should have been taken at nearly the same time and within twenty miles of each other. There is a possibility, of course, that this last one is one of the same individuals recorded by Mr. Wood, as the locality where it was taken is directly on what would appear to be the natural channel of its migration route to the north.

Actodromas fuscicollis. WHITE-RUMPED SANDPIPER.—Mr. Wood's statement in 'The Auk' (XXIII, pp. 458, 459) that this species is common in eastern Michigan we received with a good deal of surprise. The above record and that of Mr. Taverner's (*ibid.*, p. 335) are the first that we have been able to find for this section. Mr. Swales has known Mr. Wood for a great many years intimately—in fact up to the spring of 1904 they were constant field companions, but in none of their ornithological talks

did Mr. Wood ever mention having seen this species even when the subject of conversation turned on the results of these same Port Austin trips. It is certain that none of these birds were taken, or if taken they were not preserved. We believe that Mr. Wood's identifications of the White-rumped Sandpiper on the Lake Huron shore are purely retrospective and that an entirely misleading conception has been given of the status of this species in the State.

Charadrius dominicus. GOLDEN PLOVER.—The standing of this species in our local list is far from satisfactory. It seems to be generally regarded as a more or less common migrant, but specimens to support the claim are not forthcoming. We have found but one bona fide specimen for the Detroit River,—N. A. Wood, Oct. 12, 1895, Gibraltar, Mich. Others have upon examination proved to be Black-bellied Plovers (*Squatarola squatarola*). We have found the latter common during the falls of 1905 and 1906 at Point Pelee and have met with but one each year of the Golden. The experience of W. E. Saunders in southern Ontario has been about parallel with ours in regard to the relative abundance of the two species, and Mr. Fleming (Auk, XXIII, p. 451) gives information pointing to the conclusion that the Golden Plover is an erratic visitor to our shores, while the Black-belly is a regular and common local migrant. It seems that most, if not all, the Lake Erie and Ontario records of the Golden Plover are fall ones, yet this is just the season that they should not be found here, according to W. W. Cooke in his 'New Facts About the Migration of Birds,' 1903. The mention of *S. squatarola* in most of our local lists is suspicious in the light of the above. The well known sportsman writer, Ed. Sandys, has an entertaining account (Outing, 1899, p. 183) of the unusual abundance of Golden Plover in the region of the Thames River, on the Canadian side of the Lake St. Clair, during September and October; and again (*ibid.*, 1897, p. 305), he states that on the shores of Lake St. Clair he found them very common October 15, 1896. Immediately on the other side of the lake, we have never been able to get track of the species, either by personal observation or by talks with the shooters.

Arenaria morinella. RUDDY TURNSTONE.—We have seen a case containing two high-plumaged Turnstones that Mr. Campion

tells us he took near the River Rouge. He says there were five in the flock and he got them all. It was in the spring, about 1898. He also reports mounting a Turnstone for the Mr. Conely before mentioned under the head of Phalarope. Mr. Taverner took one at Point Pelee September 15, 1905. This appears to exhaust the records for this section.

Accipiter atricapillus. AMERICAN GOSHAWK.—Prior to 1906 we have but two records for the Goshawk in the neighborhood of Detroit, namely, Wayne Co., Dec. 24, 1898, and Oakland Co., Oct. 30, 1905. This fall, however, we have had a flight worthy of more than passing notice. October 15 we flushed a large *Accipiter* that we were confident was of this species at Point Pelee, Ont., but did not receive confirmatory evidence of the correctness of our identification until October 21, when we received an adult male from the same locality, followed by an adult and a juvenile October 23. On November 8 we received four birds, and November 14 three, all from the Point. The first local specimen was in the taxidermist's hands about October 29, and single birds were received November 10, December 11, 24, 30, and January 18. Several were reported from Pelee December 1 and January 18. Of all these but two were juveniles, one as above mentioned and the first of the local birds. Of the remainder, two of the Pelee and one of the others had a trace of the dark stripings of the immature plumage, and were, we should judge, birds of the second year. From these specimens it was easy to pick out four distinct plumages, which seems to indicate that the species does not attain its full plumage until the third year. The winter of 1896, saw a flight of Goshawks at Toronto when the same conditions as to the scarcity of young birds prevailed (see Auk, XXIV, p. 72), and again this year Mr. Fleming reports another one like it. Strange to relate, however, in the intermediate territory at London, Mr. Saunders has seen no Goshawks at all this fall. Correspondence has shown that the flight has not penetrated into the interior of the State, where the only records that we hear of have been from Midland and Clare Counties, where, however, the species seems to be a more or less common visitor. The flight also seems not to have crossed Lake Erie, as Dr. Lynds Jones spent some time at Cedar Point, directly opposite Point Pelee, on

the Ohio shore during the height of the flight and does not mention them in his report of his trip (Wils. Bull., Dec., 1906).

Nyctea nyctea. SNOWY OWL.—We have also had a flight of Snowy Owls this fall and early winter, that has not been so remarkable for the number of individuals as for the peculiarities of the individuals composing it. Hitherto the general run of Snowy Owls taken here have been of the usual heavily marked form. This fall, however, the males have all been of a remarkable whiteness. The first one of the season was received from Point Pelee, November 1, and must have been taken a few days previous. This is a male and nearly white. What darker markings there are, are very light in color and are sparsely sprinkled over the wings and lower breast. We received another, a female of the usual dark coloration, from the Point November 7. Since then five have been examined in the shops, two coming from Port Huron, both white, and one from Grosse Isle in the lower Detroit River, which is almost immaculate. The other two were females and were dark. All males have been light and all females dark. It seems that this flight must have originated in a different geographical quarter than previous ones. It is known that in the northwestern Provinces of Canada this light bird is the usual form, and it is most likely that these birds came from somewhere in that direction, while our usual visitors originate some distance further east. The occurrence of the dark females indicates nothing to the contrary, as the female of the white male is invariably of the dark type. From what data we can gather it does not seem that this whiteness is the result of full maturity, otherwise it might be inferred that this is an irruption of adults somewhat resembling the flight of Goshawks described above. That there is something more than ordinary in the occurrence of these birds this fall is evident on studying their peculiar distribution over Michigan and Ontario. A map showing the occurrence of the Goshawk this fall would do equally well for the Snowy Owl. White birds have been common at Toronto, as we are informed by Mr. Fleming; none of any kind have been noted at London by Mr. Saunders, and there are no reports from the interior of the State. The only way we can account for this strange state of affairs is that these two species have followed some such route as Taverner mapped out (Bull. Mich.

Ornith. Club, 1905, pp. 3-7). We surmise that they came down from some point to the northwest of us, and at the head of Lake Huron divided into streams, one following the main land around the indentation of Georgian Bay and then overland to Toronto; and the other cutting across the mouth of the bay via the Manitoulin Islands to the Bruce Peninsula, and thence down the shores of Lake Huron to their present recorded distribution.

Empidonax flaviventris. YELLOW-BELLIED FLYCATCHER.—Up to the summer of 1906 we regarded this species as a rare migrant, but August 12, 1906, we secured one and observed several more, and from then on found it one of the commonest of the *Empidonaces*. At Point Pelee we have found it abundant all through September in both 1905 and 1906. It is probable that hitherto it has been overlooked here owing to the notorious difficulty of separating the small flycatchers in the field, and the lack of attention that is generally given them. The seeming absence of this flycatcher along the Ohio lake shore is probably due to the same cause, as it is most improbable that it should be so abundant at Pelee and as rare on the Ohio shore as the published records would lead one to suppose. From our experience with the Yellow-bellied Flycatcher, we regard it as a more or less common and likely regular migrant in southeastern Michigan.

Hesperiphona vespertina. EVENING GROSBEAK.—This winter (1906-07), this rare straggler has again been with us for the first time since the general flight of 1889-90. We had received reports of its occurrence a few miles inland but it was not until December 30 that its appearance here was announced by a male being brought in to one of the taxidermist shops of the city. So far, January 28, this is all we have heard of in the immediate vicinity.

Carpodacus purpureus. PURPLE FINCH.—Although this bird is reported as a not uncommon winter resident inland (Ann Arbor and Plymouth), we have no winter dates for its occurrence here. During the past fall we met with a great number of Purple Finches both here and at Point Pelee. The interesting feature observed was the silence of the adult red birds. The olive juveniles sang freely, but the bright ones uttered but monosyllabic call notes, and in no case made any attempt to sing. Also there were but two types of plumage observed, good bright red adults and plain olive juveniles; there were no intermediates.

Loxia leucoptera. WHITE-WINGED CROSSBILL.—Records of the White-winged Crossbill in southeastern Michigan are few and far between. Jas. B. Purdy records (Cook, Bds. of Mich., 1893, p. 108) that he secured a pair at Plymouth but gives no further data. During the past fall the species seems to have been generally distributed over southern Ontario, and on November 8 Mr. Swales found a small flock on Belle Isle, in the Detroit River opposite the city. These birds, two of which were males, were feeding on the ground on the edge of the woods and were very tame. November 13, we received a male from Point Pelee. The species seems to have been common at London since early November but we can get no satisfactory evidence of its appearance in the State west of us.

Coturniculus savannarum passerinus. SAVANNA SPARROW.—In 'The Auk,' XXII, p. 89, Mr. Taverner recorded the breeding of the Savanna Sparrow in the meadows of St. Clair Co., on the edge of the Flats. In 'The Auk,' XXIV, p. 97, appears what is evidently an oblique criticism of the same. It may be well, under these circumstances, to enlarge upon the previous record and give the facts of the case as they occurred. We do not for a minute admit that the occurrence of an individual or a pair in the breeding season warrants the conclusion that they are breeding, when found outside their known range, but the reader can judge of the following facts. In these rather damp meadows we found the Savanna Sparrows in considerable numbers throughout the spring and summer. Those taken had the skin of the abdomen thickened and all other indications of being breeders. The nests were not looked for, as we deemed their occurrence in numbers throughout the breeding season was evidence enough, especially as Taverner had already found them regular breeders at Port Huron, a few miles north, and W. E. Saunders had reported them as common on the opposite side of the Flats. We thought it nothing strange that they should breed here, and published the fact merely as a matter of record. Since then we have invariably found them in the same numbers in the same place during the full spring and summer months. We think the evidence is perfectly satisfactory, far more so, in fact, than that of the breeding of the Black-throated Blue Warbler (Auk, XVII, p. 390).

Melospiza cinerea melodia. SONG SPARROW.—The Song Sparrow occasionally winters with us in limited numbers and in certain favored places. We have three January specimens taken in 1906 and 1907, and though mid-winter birds, each was very fat indeed when killed. Whether it is only those in exceptionally good condition that can remain in winter or that those that stay with us find food abundant it is hard to say.

Cardinalis cardinalis. CARDINAL.—There is no doubt but that the Cardinal is on the increase with us in southeastern Michigan. In the immediate past it has always been observed in singles, and then generally in the winter. In the fall of 1904 we found a brood of young birds, accompanied by both parents, and with the neosoptile still attached to the feathers, on the main land near the St. Clair Flats. In May, 1905, two were observed at Flat Rock, on the Huron River, and again January 6, 1907, we met six scattered along the river between Flat Rock and Rockwood. Besides these we have met single individuals in most of the spring, fall, and winter months between Detroit and the mouth of the Huron River. The valley of this stream seems to be the main artery of their distribution in this section, and they are now reported as rather common as far up it as Ann Arbor. Mr. Taverner was well acquainted with this region and its birds from 1892-94, and at that time the Cardinal held its position in the Washtenaw Co. list solely on the ground of a single old record. The same seems to have been true of Wayne Co., though there seems to be good evidence that some half a century ago it was a still more common feature of our landscape than it is even now. Many old residents speak of the "red birds" that they used to see. We do not think that they have confused the Tanager with this species, as they mention its whistling powers, and, besides, the Cardinal has always been a common cage bird here and was well known. If this is so it seems to indicate that some large cycle is completed and the Cardinal is but regaining a lost habitat.

Dendroica striata. BLACK-POLL WARBLER.—Though one of our most abundant fall migrants, this warbler has yet to be detected in the spring in Wayne Co. To the west, north and east of us, however, it appears to be a rather irregular but not uncommon spring migrant. It is often observed at Ann Arbor, Mr. Taverner

met it during the springs of 1901 and 1902 at Port Huron, and Mr. Saunders regards it as not uncommon at London. We met the species in limited numbers in May, 1905 and 1906, at Point Pelee. It seems then that Detroit is carefully avoided by this bird in the spring and is an indication of the peculiar situation this section occupies migrationally.

Thryothorus ludovicianus. CAROLINA WREN.—August 11, 1906, we added this species to the Wayne Co. list when Mr. Taverner took a juvenile male near Palmer Park, on the outskirts of Detroit. We were first attracted by its clear, bubbling, liquid notes proceeding from a tangle of blackberry canes. Though a young bird it is not sufficient to found even a hypothetical breeding record, as it could fly perfectly and might have come from almost any distance. It is rather interesting to note that most of the extralimital cases of this bird's occurrence in the adjoining sections have been in the fall, and seem to indicate that this species has a tendency to wander north after the breeding season, as do the herons and some other birds. It may be explained by the fact that all birds are more numerous in the postnuptial than in the prenuptial season, due to the great numbers of newly raised young. There may therefore be greater chances of rare birds being seen then. For various reasons, however, we incline to the former than to the latter explanation. For one thing, the same movement seems to occur in the Cardinals and hitherto more adults have been observed here in the fall than immatures.

Sitta canadensis. RED-BREASTED NUTHATCH. — This little nuthatch is something of a puzzler. It is a migrant here, yet we understand that it winters in the Upper Peninsula. With us it is extremely erratic in its appearance, being common some years and then absent for several years in succession. This fall (1906), for the first time in some years, it was common. The first specimen was seen in the city August 30. September 1 to 3 they were common at Point Pelee, and still more so from the 15th to the 22d, and October 15 vast numbers were seen there. They were everywhere, in the hard woods, hanging head downwards from the tips of the long branches, in the orchards, creeping over the trunks, and in the red cedar thickets; but by far the largest numbers were towards the end of the Point on the edge of a waste clearing where

every dead and dry mullen stalk had several of their little blue forms upon it. There seemed to be hundreds in sight at one time. They did not appear in anything like such numbers about Detroit, and we did not see more than a couple or so at a time and generally three or four made a day's record. The last one was seen October 21 at Rockwood, though Mr. Taverner saw a pair taken at Ypsilanti Jan. 11, 1907. The occurrence of these birds seems to have been pretty general this fall and we have reports of them through lower Ontario and adjacent portions of this State. A comparison of the old records of Mr. Swales with those of Mr. Saunders of London shows a strong similarity of abundance that no other species that we have compared in this way has revealed. It indicates that the movements of this species are not so eccentrically erratic as some others, or, rather, the same causes that move the winter visitors of southern Ontario also brings ours down. There is, then, a connection between the Red-breasted Nuthatches of Ontario and Michigan that is not evident in other species. Indeed, from the study of the winter migrants of the two sections, as a whole, we are confident that their winter migrations are entirely independent of each other. There is a strong similarity just along the boundary between the two countries but it does not extend to any distance inland.

THE BEWICK WREN IN THE DISTRICT OF COLUMBIA, WITH A DESCRIPTION OF ITS SONG.

BY ARTHUR H. HOWELL AND HENRY OLDYS.

THE Bewick Wren (*Thryomanes bewicki*) has for some years been known as a rare visitant in the District of Columbia, occurring mainly during the spring migration (April). Since Mr. Ridgway's published records of its occurrence here¹ it has been noted a number of times by various observers, and during the seasons of 1905 and 1906 we secured evidence of its probable breeding within our limits.

A single bird was observed at Petworth (a suburb of Washington) on April 29, 1905, our attention having been called to its song by Mrs. Arthur Brown, who said the bird had been living in the near vicinity of her house for several weeks. It was noted by her many times during the spring of 1905, but disappeared in July to reappear, however, in April of the following year. On June 2, 1906, we visited the locality and spent several hours watching the wren and listening to its varied and attractive song. The bird was restless and very active, choosing usually for its perches some high and exposed situation, such as the pinnacle of a roof or cupola, or a dead branch on some large tree. After singing for a short time from one of its perches it would fly to another some distance away, and at once sing again, but it remained constantly within an area of not more than four or five acres. Its beat included several suburban streets and a number of houses, but was surrounded on three sides by open fields and woodland.

We heard the bird again later in the month (June) but at no time did we find a nest or even a mate — if it had one. Following is a list of all the records of this species in the vicinity of Washington that we have been able to secure, most of them kindly furnished by Dr. Charles W. Richmond:—

April 10, 1882.	Arlington, Virginia.	Specimen taken by Wm. Palmer.
April 6, 1883	" "	" " " " "
April 8, 1888.	Washington, D. C.	" " " M. M. Green.
April 22, 1888.	" "	One seen by " "

¹ Auk, IX, 1902, p. 307.

Nov. 24, 1889.	Four Mile Run, Virginia.	Specimen (♀ ad.) taken by J. D. Figgins.
Dec. 22, 1890.	Washington, D. C.	One seen by Chas. W. Richmond.
March 26, 1897.	" "	Specimen taken by Jas. H. Gaut.
April 5, 1892.	Brookland, D. C.	One seen by Robt. Ridgway.
April 4, 1894.	" "	" " " "
April 5, 1906.	" "	" " " "
April 29, 1905.	Petworth, "	" " " A. H. Howell.
June 2, 1906.	" "	" " " Howell & Oldys.

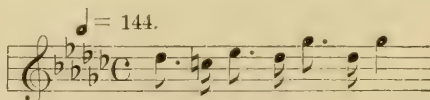
The following account of the singing of the wren is based on material secured on the occasion of our joint visit to the locality on June 2. The notations were made from the songs as they were delivered and were verified from subsequent repetitions of the phrases uttered.

The first song heard was made up of equal parts of the Grasshopper Sparrow's buzz and the Chipping Sparrow's rapid repetition of one note. Taken as a whole the song was somewhat suggestive of that of a Chewink. After repeating this strain for a while, the bird changed to the following song, delivered in the voice of a Field Sparrow:



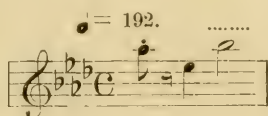
The opening notes were two (sometimes one) introductory squeaks, that suggested the idea of sounds made by the vocal machinery in starting. The next three were clear and resembled the beginning of the song of a Song Sparrow, though clearer than is usual with the Song Sparrow. The closing note was a rapid repetition of a single tone (indicated by the dotted line above), in quality and character hardly distinguishable from the usual closing note of a Chewink.

After one or two other changes of theme the wren, with delightful versatility, swung into a charming little song, which began with a melodious arrangement of clear notes marked by an attractive rhythm, very unusual, if not unique, among birds:

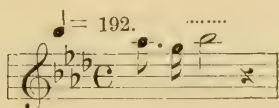


No sufficient opportunity offered to write the rest of the song on the staff, but the three notes with which it closed may be indicated by the syllables '*sweet, sweet, sweet,*' uttered rather rapidly.

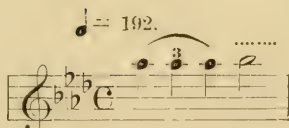
This song bore no resemblance to that of any other bird in this region, and was probably the wren's own. But that the Bewick Wren is an excellent mimic, was very palpably shown by the individual bird under consideration. The possession of an imitative faculty was indicated by the first songs noted; but before the interview was over the bird gave unquestionable proof of its powers by directly imitating the songs of a Chewink and a Field Sparrow that were singing near by, following each song by those birds with an imitation of it. The mimicry was mainly in quality of voice and style of theme, though the intervals used by the chewink and the sparrow were fairly closely followed by the wren. Thus when the chewink sang —



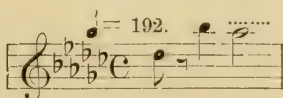
the wren responded with —



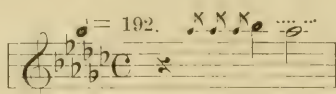
or sometimes $\frac{1}{m}$



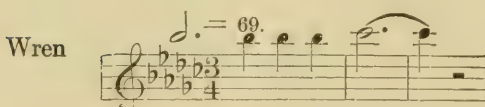
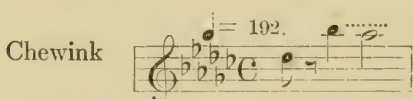
And when the Chewink changed to —



the wren altered its theme to correspond, thus:



Sometimes, however, the answering was supplemental, instead of imitative, thus —



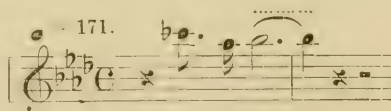
The Field Sparrow song, which occurred later, consisted of the following, with a few added, less important, notes —



As in the case of the chewink song the wren had two replies to this. The first was a nearly exact reproduction of the Field Sparrow's notes, though with a different tempo —



The second was, as in the second rejoinder to the chewink, rather more supplemental in character —



As far as may be safely permitted by this limited, but satisfactory, observation, the Bewick Wren must be accorded high rank as a singer.¹ Its voice has not the ringing quality of that of the Carolina Wren, nor are its notes always as pure. But though less brilliant in tone than the Carolina Wren and less energetic in style than either that singer or the non-musical House Wren, the Bewick Wren has a sweetness of voice and an ease of delivery that are very attractive, while in versatility it far excels either of the others. And the single song heard that appeared to be its own, uninfluenced by those of other birds, is of a higher order in its musical construction than the simple themes of the Carolina Wren (the House Wren's voluble utterance, though pleasant to hear, bears no resemblance to human music).

In imitative ability the Bewick Wren has, apparently, no rival among our eastern birds other than the Mockingbird, by which, however, it is greatly excelled. The Carolina Wren and Brown Thrasher seldom imitate other birds, despite a popular belief to the contrary, and the few imitations they give are delivered in their own quality of voice — translations into their own tongue, so to speak. The Catbird attempts imitation more frequently than Thrasher or Carolina Wren, but also renders imitated songs in its own tongue and often merely mingles bits of mimicry with its own disconnected, ejaculatory phrases. The Chat sometimes, though rarely, reproduces other birds' songs fairly well, and a few more birds show traces of the faculty;² but none of these is to be compared with the Bewick Wren. The latter, during the short period of observation under consideration gave a number of imitations and not only reproduced notes uttered by other birds in the vicinity but performed the more difficult feat of reproducing with a considerable degree of exactness the quality of tone in which they were uttered. It seems to be better entitled to the sobriquet of 'Mocking Wren,' than the Carolina Wren, on which the name is sometimes inappropriately bestowed.

¹ I have listened many times to the songs of the Texan Bewick Wren, whose musical talents apparently are fully equal to those of the eastern subspecies. The songs given by the Texas birds resembled in form and tone quality the finest song heard from the Petworth Wren, and there was an almost endless variety in the construction of the songs.—A. H. H.

² I have even heard the English Sparrow give an excellent reproduction of the Carolina Wren's musical alarm note.—H. O.

CONCERNING CERTAIN SUPPOSED INSTANCES OF
THE OCCURRENCE OF THE CINNAMON TEAL
IN FLORIDA AND SOUTH CAROLINA.

BY WILLIAM BREWSTER.

It is by no means easy to distinguish females and young males of the Red-breasted or Cinnamon Teal (*Querquedula cyanoptera*) from those of the Blue-winged Teal (*Querquedula discors*), even when accurately named skins of both species are available for comparison. Without the aid of such material no ornithologist, however experienced, should attempt to positively determine any but fully adult male birds unless his specimens were obtained in regions where the species to which he is inclined to refer them is known or likely to occur and the other bird is almost certainly not to be found. The impression — rather generally entertained it would seem — that the Cinnamon Teal is always red-breasted is wholly without foundation, for as a rule — if not invariably — only males in full nuptial plumage are thus characterized. On the other hand Blue-winged Teal of both sexes and of various ages are often conspicuously tinged on the breast, belly and flanks, with reddish brown or rusty. This appears to be merely a superficial stain — perhaps derived from contact with mineral matter held in solution in water or in semi-liquid mud. It is too nearly indelible, however, to be removed by vigorous and repeated washing, and it probably persists until the plumage is changed at the next regular moult. It is by no means peculiar to Blue-winged Teal, for it may be noted in occasional specimens of most of the ducks which, in autumn and winter, frequent the fresh and brackish waters of our South Atlantic States. I am not aware that it ever occurs in the Red-breasted Teal, but that it may do so occasionally is not improbable. Females and males of the species last named are said to differ from those of the Blue-winged Teal in having coarser and more pronounced dark markings on the under parts. There may be a tendency to dissimilarity of this kind, but I have not found that it is either pronounced or constant. A better character in my opinion is that afforded by the bill, which is almost invariably

longer and narrower in *cyanoptera* than in *discors*. I have seen one or two birds, however, which, after the most careful study, I have been unable to satisfactorily determine by the tests just mentioned or by any others known to me.

In view of these inherent difficulties and popular misconceptions it is perhaps not to be wondered at that reddish-stained specimens of the Blue-winged Teal, such as I have just described, should be sometimes mistaken for Cinnamon Teal, even by ornithologists of good standing and large field experience. That several important published records of the supposed occurrence of *Q. cyanoptera* in our South Atlantic States were either certainly or probably based on erroneous identifications of this kind I shall now proceed to show.

The earliest of these records is by Dr. J. A. Allen who, writing in 1869,¹ says: "This species [*Q. cyanoptera*] was found by Mr. Maynard in great numbers in the savannas of the upper part of Indian River, but unfortunately the specimens he obtained were lost."

Mr. Maynard told me, not long after this experience happened, that his birds were identified in the field and that he referred them to *cyanoptera* merely because of the fact (which he supposed at the time to be conclusive) that their under parts were tinged with reddish. When Mr. Cory and I were shooting in these same 'savannas' in February, 1889, we found no Red-breasted Teal, but wintering Blue-wings were met with in numbers and several of the specimens we killed had rusty-red bellies and breasts. These and other considerations have long since led me to believe that the birds originally recorded by Dr. Allen were probably all Blue-winged Teal. In his 'Birds of Eastern North America' Mr. Maynard mentions the Red-breasted Teal only in the Appendix where (on page 520) he merely says: "Occurs west; accidental in Lou. and Fla." In the second edition of this work he includes the species in the main body of the text (on page 121), but with only the brief statement that it "is occasionally found in the Gulf States, even as far east as Indian River, Florida." He now writes me (under date of February 23, 1907) as follows:

¹ J. A. Allen, On the Mammals and Winter Birds of East Florida, Bull. Mus. Comp. Zool., II, No. 3, Oct., 1869, 363.

"During my first trip to Florida in 1868-69....I found two species of Teal very abundant about the head of Indian River (on the east side) in pools in the marshes. My note book says that these were *Nettion carolinensis* and *Querquedula cyanoptera*.... Two or three [of the latter] were shot along the shore. These specimens were never skinned but were plucked and eaten as we were in need of provisions at the time. The birds taken, either young males or females, were strongly reddish in tinging on the tips of the feathers of the under parts. Until my second visit to the same place in the early 70's I did not find out that this tinging was due to a stain caused by iron-impregnated water of some pools which I had not seen on my first trip, but which the birds appeared to frequent. You know that many ducks become stained in this manner, but that was probably not known to me in my younger ornithological days, although I have seen it hundreds of times since.

"The reason why I include the Red-breasted Teal among the birds of Florida is on account of notes given me by Mr. Chas. Naumann of whom you know, who lived at Dummitt's for some years. He always insisted that he had taken adult males [of *Q. cyanoptera*] here.... I am sure now, however, that I never saw the Red-breasted Teal in Florida."

In 1889 Mr. W. E. D. Scott published the following note: "Under date of November 12, 1888, Mr. J. W. Atkins of Key West writes me: 'Did I give you the record of a Cinnamon Teal taken here on November 1, 1887? I have the skin in my collection, and on October 24 (this year) I examined another of the species in the possession of a boy, who had just shot it in a pond near the town,'"¹ *i. e.*, Key West. If, as we are left to infer, this youthful gunner plucked and ate his bird, he probably committed no very serious act of vandalism, for the Teal which Mr. Atkins preserved and which is now in my collection,² is nothing more nor less than a

¹ Auk, VI, 1889, 160.

² I received this bird, with a number of others taken in Florida, directly from Mr. Scott. It still bears the original label on which is inscribed, in Mr. Atkins's unmistakable handwriting, "*Anas cyanoptera*, Key West, Fla. Nov. 1/88. J. W. Atkins." It will be observed that this date is just a year later than the one mentioned by Mr. Atkins in his letter to Mr. Scott. Nevertheless it is practically certain that the specimen is the same as that to which Mr. Atkins referred in this letter where, no doubt, the date of its capture was correctly given.

perfectly typical female of *Querquedula discors*, having the under parts colored with the rusty stain already described.

Mr. Arthur T. Wayne has been similarly misled by the presence of much rusty red (and also, as he writes me, by the somewhat exceptionally coarse markings) on the under parts of an adult female Teal which he shot at Mount Pleasant, South Carolina, on April 12, 1904. After having reported¹ this bird as an example of *Q. cyanoptera* he very kindly sent it to me for examination. Like the specimen taken by Mr. Atkins at Key West it is, without question, a Blue-winged Teal.

Still another eastern record of *Q. cyanoptera* remains to be considered. It is that by Mr. Samuel N. Rhoads² of "a fine specimen of a male Cinnamon Teal, still in the flesh," which he examined in Krider's gun store in Philadelphia. It was killed by Mr. Charles S. Hebard in Lake Iamonia, Florida, on or about February 18, 1893. Mr. Hebard, writing to Mr. Rhoads about the capture of this bird, says: "When I got to where it fell I was struck by its beauty and decided to have it mounted." This would indicate that it was not either a female or an immature male. Moreover Mr. Rhoads, in a letter to me dated December 8, 1905, asserts that his "remembrance is that" the specimen "was in nuptial or fully adult male plumage." If this were really so he could not have made any mistake with respect to its identification. It is notoriously unsafe, however, to trust implicitly to human memory in matters of this kind. On the whole the evidence given by Mr. Rhoads does not seem quite conclusive, although it certainly warrants the assumption that the bird killed by Mr. Hebard was probably a Cinnamon Teal. If the specimen is still in existence it should be reexamined and reported on by some competent ornithologist, for the record relating to it is apparently the only one remaining which affords anything like definite grounds for believing that the Cinnamon Teal has ever occurred in our South Atlantic States.

¹ Auk, XXII, 1905, 396.

² Auk, X, 1893, 362, 363.

ADDITIONAL NOTES ON THE BIRDS OF LEON
COUNTY, FLORIDA.

BY R. W. WILLIAMS, JR.

SINCE the publication of my last paper on the birds of Leon County, Florida (Auk, XXIII, 153), some further information has been obtained and additional observations made. Nine species are now recorded for the first time, and I add a few notes respecting species included in my former papers.

The numbers are continued in serial order from my last paper for the purpose of indicating readily the whole number of species recorded for the county.

174. *Gavia imber*. LOON.—Has been seen several times in late years on the larger lakes.

175. *Querquedula cyanoptera*. CINNAMON TEAL.—In volume X of 'The Auk,' p. 362, Mr. Rhoads records the capture of a Cinnamon Teal on Lake Iamonia, Florida, but does not designate the county, which, in this case, is very important since this lake, though large, is not so well known as to be readily located without more definite directions. The lake is in Leon County a few miles south of the Georgia line. This specimen was taken about February 18, 1893, by a Michigan sportsman who was at the time hunting snipe on the marshes of the lake. The bird was preserved and afterwards mounted. I have another record, more recent. On November 17, 1906, Mr. E. B. Garner of Tallahassee killed one on Lake Jackson. It was feeding with a flock of Green-winged Teal.

176. *Aythya americana*. REDHEAD DUCK.—Mr. E. B. Garner has taken several Redheads on Lake Jackson in the past few years.

177. *Aythya vallisneria*. CANVASBACK DUCK.—Mr. Garner and others whose identifications can not be successfully questioned have taken the Canvasback several times in the past few years on the larger lakes of the county.

Aythya affinis. LESSER SCAUP DUCK.—Dr. E. M. Brevard, who has had considerable experience in hunting ducks and is well posted on the Anatidæ, found a nest of this species on Lake Jackson in the summer of 1896. The duck was flushed from her nest and eight eggs. He says that it is not unusual to see wounded ducks of this species on the lake during the summer, and this would seem to explain the nesting of this bird so far from its summer haunts.

178. *Erismatura jamaicensis*. RUDDY DUCK.—This is one of the most numerous species of ducks found in the county during the winter and was omitted from my former papers through inadvertence.

179. **Guara alba.** WHITE IBIS.—Occurs regularly in the county during spring and summer, and I have reason to believe some of the cypress swamps in the western part of the county will be found to be its nesting haunts.

180. **Dryobates borealis.** RED-COCKADED WOODPECKER.—This woodpecker is very locally restricted. Since my last paper was published I have found it in the northern and eastern portions of the county, always in tracts of pine land. My only opportunity to observe it has been in winter so I am unable to say whether or not it nests with us, but it is altogether probable that it is a constant resident in the county.

181. **Spinus pinus.** PINE SISKIN.—My first record of this bird for the county was made on January 6, 1907, while I was passing through McDougall's pasture. My attention was drawn to a number of Goldfinches that were watering in a little pool on the edge of the swamp, and to others perched in some small trees near by. I turned my glasses upon them and discovered several Siskins in their midst. The whole flock shortly flew to the sweet gum trees a little distance beyond. I followed and found the Siskins searching for food in the sweet gum burs, along with the Goldfinches.

Vireo solitarius. BLUE-HEADED VIREO.—This species is a winter resident with us. There was one in our yard during the whole of the past winter. It is not very abundant at any time and can be easily overlooked.

Vireo noveboracensis. WHITE-EYED VIREO.—This bird is with us throughout the entire year, but it is probable that the winter residents are those which have spent the summer in the north and that our summer residents pass further south in winter. There is always one in our yard during the winter.

Helminthophila bachmani. BACHMAN'S WARBLER.—In 'The Auk' for January, 1905, p. 85, Mr. Rehn of Philadelphia, noting my record of this bird for Leon County in the previous number of 'The Auk,' adds another instance of the occurrence of this species in the county. He says: "On March 22, 1904, while in company with Mr. Morgan Hebard of Thomasville, Georgia, I collected a male specimen of this species in a black gum swamp in the extreme northeastern section of Leon County, about four miles distant from the Georgia line. The individual taken was in company with several others which appeared to be the same species, but as the identity was not known until the specimen was in hand, no others were secured."

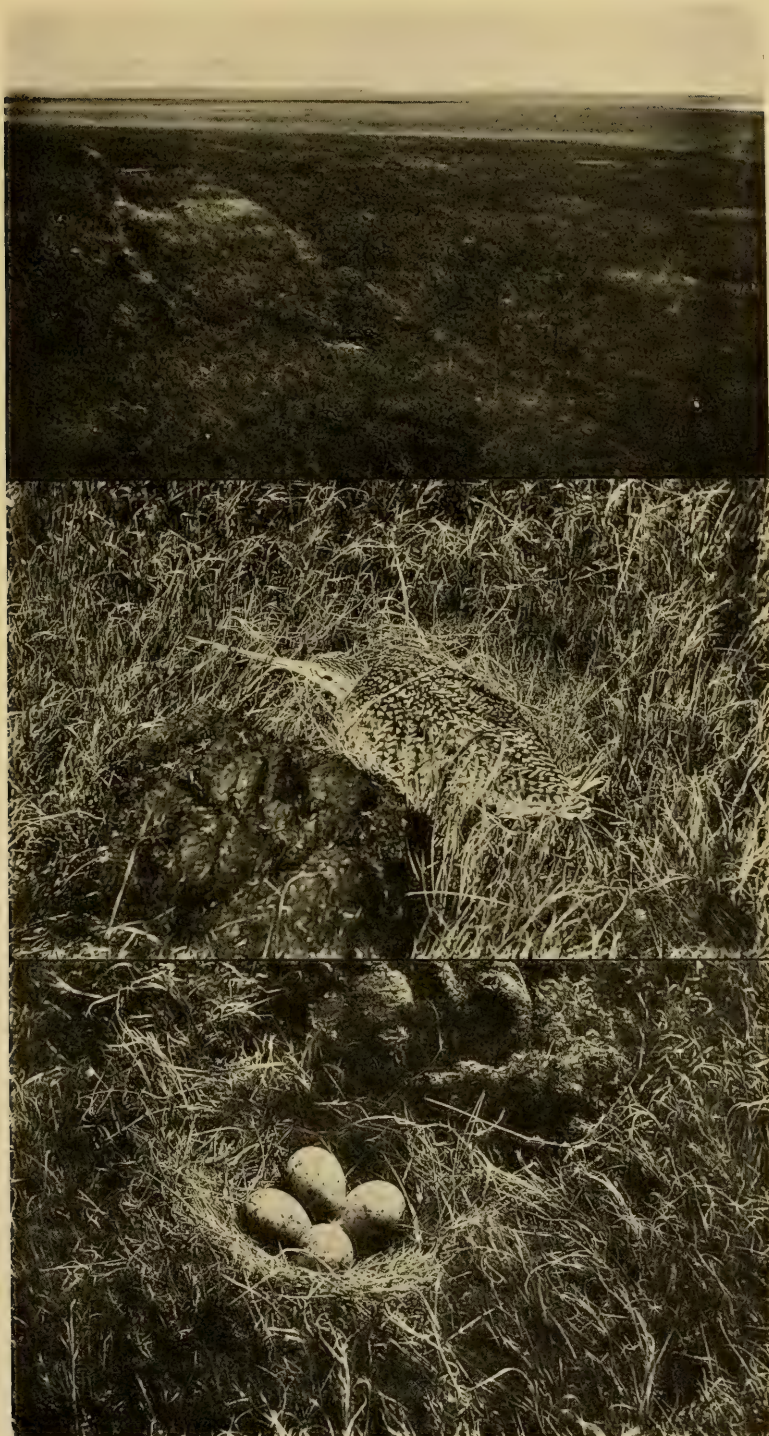
182. **Sitta carolinensis.** WHITE-BREASTED NUTHATCH.—I have often searched for this bird in our county, but until Dec. 23, 1906, I could not find it. On this date I recorded it in Choate's woods, a half mile from town. The bird was alone. A short time before this I had seen three of the birds so close to the eastern and western boundaries of the county that it was impossible to determine, at the time, whether they were in Leon, Jefferson, or Gadsden County, and I consequently did not claim them for Leon County.

THE MARBLED GODWIT ON ITS BREEDING
GROUNDS.

BY A. C. BENT.

Plate III.

IT WAS on the twelfth day of June in 1901 that I first made the acquaintance of this magnificent shore bird. We had been collecting for several days in some extensive sloughs bordering a large lake in Steele Co., North Dakota, which we have found exceedingly rich in bird life. Canvasbacks, Redheads and Ruddy Ducks were nesting in the bulrushes and flags, as well as numerous Coots, Pied-billed Grebes and Black Terns. Red-winged and Yellow-headed Blackbirds fairly swarmed through the reeds and filled the air with their ceaseless din. Sora and Virginia Rails were breeding about the edges of the sloughs, concealing their nests in the little tussocks of grass growing in the shallow water. The beautiful Wilson's Phalaropes were flitting about among these tussocks, and it was while hunting for their nests that we noticed, among the numerous noisy Killdeers and Western Willets flying over us, a strange hoarse note, strikingly different from either, as a large brown bird flew past, which we recognized as a Godwit. All doubts were soon dispelled by collecting my first specimen of a species I had often longed to see, and I could not help pausing to examine and admire the beautiful markings of its richly colored wings. We saw only four of these birds that day, but on the following day they became more abundant. There were about twenty of them flying about over the meadows, showing considerable concern at our presence, constantly uttering their peculiar cries, and showing so little regard for their own safety that we were led to infer that they were breeding or intending to breed in that vicinity. We spent some time looking for their nests, but, as we knew practically nothing about their nesting habits at that time, we were not successful in locating any nests. They may have been merely recent arrivals, possibly only transient migrants, but they should have been in their breeding grounds at this date or earlier.



MARBLED GODWIT.

But it was during my two recent trips to Assiniboia and Saskatchewan in 1905 and 1906 that I became more intimately acquainted with the Marbled Godwit in its summer home. That portion of northwestern Canada, lying north of Montana, which was formerly called Assiniboia, is now included in the new Province of Saskatchewan, and it was in the southwest corner of this province, along the line of the Canadian Pacific Railway, that my observations were made. To a casual observer, passing through this region in a railroad train, the country seems barren and uninteresting — an endless waste of bare rolling plains and low-lying hills, broken only by an occasional small frontier town, or by the scattered houses of the hardy ranchmen, who make a living by raising cattle, horses, and sheep, which are allowed to range at will over the unbroken plains.

But to the ornithologist this region is full of interest. It is well watered with numerous small streams, spreading out in many places over broad, grassy meadows, over which clouds of Black Terns are hovering; numerous ducks of various species may be seen swimming in the shallow sloughs, or jumping into the air, and flying off as the train alarms them. Every small pond-hole is sure to be occupied by one or more pairs of ducks, and the larger lakes and sloughs are full of water birds of various kinds. Alkali lakes and ponds, with their broad, whitish mud flats, are frequently passed, and these are generally tenanted by flocks of migrating shore birds, or by a few pairs of graceful and showy Avocets. Thus, though bird life may be scarce over the greater part of this region, in favorable localities, such as the vicinity of lakes and streams, birds are exceedingly numerous, rich in species, and abundant in numbers.

The lakes are generally wholly or partially alkaline, with barren, muddy, or stony shores, and without vegetation in or around them. But many of the larger lakes have fresh water streams running into them, and about the mouths of the streams are more or less extensive deep water sloughs, overgrown with tall bulrushes, and sometimes a few cat-tail flags. These form the great breeding grounds for wild fowl — Western, Horned and American Eared Grebes, Canvasback, Redhead and Ruddy Ducks, Franklin's Gulls, American Coots, American Bitterns and Yellow-headed Blackbirds; and the surrounding shores and meadows offer a

most congenial home for the breeding shore birds—Marbled Godwits, Western Willets, Bartramian Sandpipers, Wilson's Phalaropes, and Killdeers.

Along the lower courses of the streams, near the lakes, but sometimes extending for a mile or more back from the lake, are usually found broad, flat, alluvial plains, low enough to be flooded during periods of high water. These plains are more or less moist at all times, are exceedingly level, and are covered with short, thick grass only a few inches high. Such spots are the chosen breeding grounds of the Marbled Godwit, and, so far as our experience goes, the nests of this species are invariably placed on these grassy plains or meadows.

The Godwit makes no attempt at concealment, the eggs being deposited in plain sight in a slight hollow in the short grass. We found, in all, four nests of this species with eggs, had two sets of eggs brought to us by ranchmen, and found two broods of young. The first nest was discovered on May 29, 1905. We had been hunting the shores of a large alkaline lake, where a colony of Avocets were breeding on the mud flats, near the outlet of a deep, sluggish stream, and it was while following along the banks of this stream, as it wound its devious course down through a series of broad, flat meadows, that I flushed a Godwit out of the short grass only a few yards from the stream, and about one hundred yards from the lake. On investigation I found that she had flown from her nest, merely a slight hollow in the grass lined with dry grass, which had, apparently, been simply trodden down where it grew, without the addition of any new material brought in by the birds. Only two eggs had been laid, so we marked the spot for future reference and retired. On June 5 this nest was photographed, and the four eggs which it then contained were collected. The set is now in my collection, and may be described as follows:—The ground color is a rich olive buff on three of the eggs, paler on the fourth; the most richly colored egg is rather sparingly marked with spots and small blotches of dull tawny olive and pale drab; the other three are sparingly marked, chiefly about the larger end, with spots and small blotches of raw umber, mummy brown and pale drab or lilac; in shape they are all ovate pyriform; the measurements are as follows, in inches: 2.24 by 1.53, 2.29 by 1.52, 2.14 by 1.50, and 2.16 by 1.53.

While driving across a low, wet meadow, towards a reedy lake, on June 8, 1905, and when about two hundred yards from the lake, we were surprised to see a Marbled Godwit flutter out from directly under the horse, which was trotting along at a leisurely pace. We stopped as soon as possible, and found that we had driven directly over its nest, which barely escaped destruction, for it lay between the wheel ruts and the horses foot prints, one of which was within a few inches of it. The nest was in every way similar to the first one, the bird having beaten down the short grass to form a slight hollow in which the four handsome eggs had been laid in plain sight. We photographed the nest and collected the eggs, which are now in the collection of Rev. Herbert K. Job. On this same meadow, and on the edge of the prairie near it, we also found two nests of the Wilson's Phalarope, and a nest of the Bartramian Sandpiper, each containing four eggs.

On June 9, 1906, we visited the locality where the first nest was found, and I enjoyed a most interesting experience with an unusually tame individual of this normally shy species. While walking across the flat meadow near the creek, I happened to see a Marbled Godwit crouching on her nest beside a pile of horse droppings. She was conspicuous enough in spite of her protective coloration, for the nest was entirely devoid of concealment in the short grass. Though we stood within ten feet of her, she showed no signs of flying away, which suggested the possibility of photographing her. My camera was half a mile away in our wagon, but I soon returned with it and began operations at a distance of fifteen feet, setting up the camera on the tripod and focussing carefully. I moved up cautiously to within ten feet and took another picture, repeating the performance again within five feet. She still sat like a rock, and I made bold to move still closer spreading the legs of the tripod on either side of her and placing the camera within three feet of her; I hardly dared to breathe, moving very slowly as I used the focussing cloth, and changed my plate holders most cautiously; but she never offered to move and showed not the slightest signs of fear, while I exposed all of the plates I had with me, photographing her from both sides, and placing the lens within two feet of her. She sat there patiently, panting in the hot sun, apparently distressed by the heat, perhaps partially dazed by it, and much annoyed

by the ants which were constantly crawling into her eyes and half open bill, causing her to wink or shake her head occasionally. I reached down carefully and stroked her on the back, but still she did not stir, and I was finally obliged to lift her off the nest in order to photograph the eggs.

The nest was exactly like the others, a hollow in the grass and lined in the same manner by pressing down the grass into the cavity, which measured seven by six inches in diameter and was hollowed to a depth of about two inches. The four eggs which it contained were found to be partially incubated. They are now in my collection and may be described as follows: The ground color is pale olive buff or cream buff; three of the eggs are quite evenly marked with well defined spots of raw umber and mummy brown, and with numerous subdued spots of lilac; the fourth is heavily blotched with lilac gray, particularly about the larger end, over which are scattered numerous irregular markings and small spots of Vandyke brown; in shape they are ovate pyriform, and they measure 2.30 by 1.58, 2.37 by 1.60, 2.32 by 1.61, and 2.31 by 1.57 inches.

Another set of these eggs, also in my collection, was brought to us by a ranchman with whom we were staying. Their ground color is somewhat darker than either of my other sets, a rich greenish olive buff; they are rather sparingly marked with small dull spots of Vandyke brown, wood brown and drab; in shape they are slightly more pointed than the others and they measure 2.26 by 1.56, 2.21 by 1.57, and 2.31 by 1.59 inches.

The flight of the Marbled Godwit is strong, swift and direct; the head is usually drawn in somewhat, the bill pointed straight forward and the feet stretched out behind. In general appearance it closely resembles the Long-billed Curlew, which it nearly equals in size, the rich brown coloring in the wings being conspicuous in both species, but the long curved bill of the Curlew serves to distinguish it, even at a considerable distance, and the notes of the two birds are entirely different. The Marbled Godwit has a great variety of striking and characteristic notes. Its ordinary call note, when only slightly disturbed, sounds like *terwhit, terwhit, terwhit*, or *pert-wurrit, pert-wurrit*, or *godwit, godwit, godwit*, from which its name is probably derived; these notes are all strongly accented

on the last syllable, and are uttered almost constantly while the birds are flying about over their breeding grounds. When considerably alarmed these notes are intensified, more rapidly given, and with even more emphasis, *kerweck*, *kerwee-eck*, or *kerreck*, *kreck*, *kreck*, *kerreck*; sometimes they are prolonged into a loud, long-drawn out scream *quack*, *qua-a-ack*, or *quoick*, *quoi-i-ick*, somewhat between the loudest quacking of an excited duck and the scream of a Red-shouldered Hawk. There is also a more musical, whistling note, less often heard, sounding like the syllables *kor-koit* or *ker-kor-koit*, *korkoit*, the accent being on the *kor* in each case; this note seems to indicate a more satisfied frame of mind and is much more subdued in tone. All of these notes are subject to great individual variation, and, as the Godwits are very noisy birds, we were given ample opportunities to study them, but to write them down in a satisfactory manner is not so easy.

Like all of the shore birds, the Marbled Godwit is exceedingly demonstrative on its breeding grounds, flying out to meet the intruder as soon as he appears, making fully as much fuss at a distance from its nest as near it, and giving no clue as to its exact location. The cries of one pair of birds often attract others, and I have seen as many as eighteen birds flying about at one time in an especially favorable locality. It shows no signs of fear at such times; often alighting on the ground within ten or fifteen yards, standing for an instant with its beautifully marbled wings poised above it, a perfect picture of parental solicitude. Even while feeding on the shores of the lakes we could frequently walk up to within a few yards of them, and Mr. Job succeeded in photographing several of them in this way.

Though we looked diligently for the young, we did not succeed in finding any until June 27, 1906. Dr. Bishop and I were driving across some extensive wet meadows, ideal breeding grounds for Marbled Godwits, when we saw a Godwit, about a hundred yards ahead of us, leading two of its young across a shallow grassy pool; we drove towards them as fast as we could, but as we drew near the old bird took wing and the young separated, moving off into the grass in opposite directions. They had evidently been well schooled in the art of hiding, and were well fitted by their protective coloring to escape notice, for, though we secured one of

them readily enough while it was still running, the other disappeared entirely, right before our eyes and within ten yards of us. Its disappearance seemed almost miraculous, for there was practically nothing there to conceal it, as the grass was quite short, and there were no shrubs or herbaceous plants of any kind in the vicinity. We searched the whole locality carefully and thoroughly, but in vain. The youngster may have been crouching flat on the ground, relying on its resemblance to its surroundings, or it may have taken advantage of some slight inequalities in the ground and skulked away further than we realized. Later in the day we found another pair of Godwits, in a similar locality, with two young, one of which we secured. The young were in the downy stage and apparently not over a week old. They showed unmistakable Godwit characters, particularly in the shape of the head and bill, and the long legs and neck. They were covered with soft down, pinkish buff in color, more pronounced on the sides and neck, paler ventrally, and almost white on the throat, chin, and sides of the head. The occiput, cervix, back, rump and wings were heavily blotched with seal brown, or clouded with hair brown, the latter color shading off gradually into the buff on the sides, where the first plumage was beginning to appear. There was a narrow loreal stripe on each side, and a medium crown stripe of seal brown, the latter running from the base of the bill to the occiput.

As soon as the breeding season is over, or even before all the broods are fledged, the Marbled Godwits begin to gather into flocks and become much more wary. Even as early as June 27, 1906, we saw as many as thirty-six birds in one flock, but, as we did not see any young birds among them, we inferred that these must have been birds whose eggs or young had been destroyed.

As I have always had to leave for the East before the southward migration began, I am unable to give any information on this subject from personal observation, but Dr. Louis B. Bishop has kindly placed at my disposal his notes relating to this movement.

At Stump Lake, North Dakota, in 1902, he noted on July 28 a flock of about one hundred Marbled Godwits, chiefly adults, all that were taken being old birds; and on July 30 he saw a flock of about fifty, which he assumed to be composed chiefly of young birds, all that were taken being in juvenile plumage. At the same locality



Allen Brooke.

HYBRID GROUSE.

Dendragapus obscurus richardsonii + *Pediocetes phasianellus columbianus*.

in 1905, he saw on July 26 a flock of about forty, both adults and young, all that were collected being young birds; on August 2, *all* of these birds had disappeared. This exact locality, a sandy point at the western end of the lake, was visited only on the above dates. These birds were undoubtedly migrants, as they were not known to have bred in that vicinity.

After I had left Saskatchewan, Dr. Bishop visited the breeding grounds of the Marbled Godwits, and on July 3, 1906, found adult birds tolerably common, but they had all departed two days later. At Big Stick Lake, from July 18 to 21, 1906, he saw large flocks of adult Godwits containing hundreds of birds, but on July 22 very few were left. He also states that adults reach the North Carolina coast in the middle of July, as he has in his collection adults taken on July 11 and 27, 1904, and that young birds appear about a month later, as he has specimens taken August 10 and 19, 1904.

Evidently the Godwits move off their breeding grounds as soon as the young are able to fly, those birds which have been unsuccessful in rearing their young being the first to leave, and forming the vanguard of the early migration in July. Probably most of the adults start on their southward migration before the end of July, and well in advance of the young, the later flight being composed almost entirely of young birds, and moving more deliberately.

A HYBRID GROUSE, RICHARDSON'S + SHARP-TAIL.

BY ALLAN BROOKS.

Plate IV.

THROUGH the courtesy of Mr. C. deB. Green I have had the privilege of examining a most interesting hybrid between *Dendragapus o. richardsonii* and *Pediæcetes p. columbianus*, shot at Osoyoos, B. C.

Roughly speaking this bird may be said to have the coloration

on the upper surface of a female Richardson's Grouse, and on the lower of a male Sharp-tail. In size it is between the two species with the following measurements: ♂ ad. wing, 8.5 inches; tail, 5.5 inches; middle toe and claw, 2.05 inches; culmen, .55 inches.

The tail is evenly graduated, the center rectrices .85 inches wide, outer .55 inches, falling short of the center pair by 1.5 inches. Feet with pectinations well developed and claws very long, middle claw .65. Feathers on tarsi long and dense, reaching beyond the first joint of middle toe. A conspicuous 'comb' over the eye deep yellow.

The marking on crown of head, hind neck, dorsal region, and scapulars very much resembles that of an adult female Richardson's Grouse; rump between the two species; wing coverts edged and tipped with white, but with none of the conspicuous round white spots of the Sharp-tail. Tail black, the central pair of feathers with a broad band of freckled gray on tip; outer feathers with diminishing tips of grayish white.

The whole under surface is very similar to that of a male Sharp-tailed Grouse; the V-shaped markings on the pectoral region are broader, and the lower tail coverts almost immaculate. The feathers on the center of abdomen are heavily marked with smoke gray down their centers.

I am also indebted to Mr. Green for the following account of its capture:

"On Sept. 15 I was going out for duck, as I had decided to shoot no Prairie Chicken that season because of the wet hatching period the spring before. On my way I passed Hiram Inglees's orchard and went in to get some fruit; while eating plums this bird came down off the mountain and flew all alone into the orchard and lit in the longish grass. I took it for a blue grouse, and went over; it was very tame, and all I could see was its head, which seemed all blue grouse, so I flushed it, intending to put it in the bag, but it got up so quietly and so near that I did not shoot, and it lit on the orchard fence. As it went off I was puzzled at it and so followed up to see it again; on the fence it bothered me more, for one way it was blue grouse, and the other way chicken, and both ways tame. I was not going to kill it unless it would fly and go fast, and I let it go off again without intending to shoot, but just

as it was almost too far I tumbled to it, and killed it by a lucky snap. The flesh was exactly half way, being neither white nor brown.

"Some days after, Hiram told me he had seen the bird repeatedly the spring before, dancing with the Prairie Chickens in his garden.

"The crop was full of leaves of the mountain laurel, and I know he must have gone higher than chicken go, to get them, but something called him down into the orchard where Blue Grouse never are seen except occasionally in July or August."

Mr. Green is of the opinion that the cross is between male Richardson's Grouse and female Sharp-tail, but the appearance of the specimen inclines me to think it is a case of a female Blue Grouse wandering down in the spring into the Sharp-tail country; as in my experience a hybrid generally favors the male parent.

The specimen has been presented by Mr. Green to the Provincial Museum at Victoria.

ASPECTS OF BIRD DISTRIBUTION IN LOUISIANA AND MISSISSIPPI.

BY HENRY H. KOPMAN.

THE writer will explain at the outset that this article has reference chiefly to the southeastern part of Louisiana and to the coast of Mississippi. It is his belief, however, that when he presents a view of some of the characteristic conditions of these sections he will call attention to facts almost if not quite unparalleled in the experience of bird students in other parts of the United States.

Assuming the normal, settled summer bird population of these regions to be the primarily characteristic element in their avifauna, we recognize its chief peculiarity in the dearth of species represented, frequently offset by a great abundance of individuals, but in other cases, much rarer, resulting in an altogether attenuated state of bird-life. The significance of the periods of migration in such regions is therefore obvious, and will be fully discussed later on.

As the regions under consideration fall naturally into two distinct topographical types, it will be convenient, first, to give a brief description of each type, and, second, to discuss the subject chosen in relation to each type separately.

The coast district of southeastern Louisiana presents an absolutely flat surface, of a very fertile alluvial soil formation, supporting, with varying circumstances, marshes, swamps, or normal deciduous forest growths, of rather monotonous uniformity in any case. At distances varying from fifty to seventy-five miles from the coast this formation is replaced by slightly higher ground presenting an entirely different soil formation wooded chiefly with pine, especially the long-leaved pine (*P. palustris*). This latter is the one aspect of coastal Mississippi, and in the case of that State requires to be treated separately only because there such country borders the seashore.

The essential uniformity of coastal southeastern Louisiana, the area centering about the delta of the Mississippi River, is revealed by the fact that all arboreal species occur with almost equal abundance in every part of this region. For a region of interest so special, this section is very extensive. From points near the mouth of the Mississippi westward to Franklin and New Iberia, and thence eastward and northeastward to New Orleans and Baton Rouge, lie the boundaries of a region haunted indifferently in all parts during the nesting season by a practically invariable group of woodland species — the Yellow-billed Cuckoo, Southern Hairy, Downy, Red-bellied, and Pileated Woodpeckers, Crested and Green-crested Flycatchers, Cardinal, Red-eyed and White-eyed Vireos, Prothonotary, Parula, Sycamore, Kentucky, and Hooded Warblers, Carolina Wren, Tufted Titmouse, and Carolina Chickadee. A varying number of species that frequent open situations, such as the Orchard Oriole, Florida Grackle, and Blue-gray Gnatcatcher, are to be found throughout the same extent of country, but as their distribution depends more or less on artificial conditions, it is of less importance in determining the biotic questions involved.

The appearance of the interior of a deciduous forest in lowland Louisiana would readily suggest a rather limited avifauna in the nesting season at least. Elm, ash, tupelo, cypress, dogwood

(*Cornus stricta*), red maple, box elder, sweet gum, red, live, and water oaks, hackberry, cottonwood, and sycamore constitute the bulk of the sylva. Maple, elm, tupelo, and water oaks preponderate, growing very closely, and exhibiting great vigor, though the size of the elms and maples especially is not usually large. In these moist shady woods, the character of insect life that particularly attracts our smaller insectivorous birds is sparingly represented. There is a rather oppressive and monotonous side to the life here, which is reflected more or less closely in the behavior of the birds. The conditions being almost identical in all spots, and food being equally abundant everywhere, the stations of nesters are distributed with decided regularity. A tendency to colonize in the breeding season is of the rarest occurrence. The same conditions that render colonization unnecessary, that is, the uniformity of the environment, frequently give rise to rather wide ranging on the part of nesters. The preoccupation of the breeding bird is less conspicuous than usual, and intimate acquaintance with their home life more difficult to arrive at. As a matter of fact, these virgin lowland woods do not always serve for nesting haunts of the several species that frequent them in greater or less abundance. Where these forests border on cleared land, lower and more varied growths appear, and such spots frequently become meeting places of the woodland breeders and the more open-loving species. Forests without any undergrowth whatever attract practically no small species as breeders except the Woodpeckers, the Crested Flycatcher, Green-crested Flycatcher, Cardinal, Summer Tanager (?), Red-eyed Vireo, Parula Warbler, Prothonotary Warbler, Sycamore Warbler; the Parula Warbler nests in such woods wherever Spanish moss occurs, the same being true of the Sycamore Warbler, while the Prothonotary Warbler selects its usual sites, as do the Titmice and Woodpeckers. The Flycatchers, Cardinal, Summer Tanager, and Red-eyed Vireo necessarily nest high under these circumstances.

Although uninterrupted growths of forest trees of the kinds already designated cover a large part of the surface of southeastern Louisiana not in cultivation, there are also considerable areas primarily occupied by lower, more thicket-like growths, consisting of small maples, tupelos, etc., interspersed with palmetto,

smilax, dogwood (*C. stricta*), and several vines, especially *Tecoma*, *Rhus*, *Cissus* and, of course, *Rubus (villosus)*. Such growths commonly occupy the lowest and wettest parts of the delta region, and often border heavy cypress swamps. The Yellow-billed Cuckoo, Cardinal, White-eyed Vireo, and Prothonotary and Hooded Warblers are almost distinctive in this type of country. Of somewhat less certain occurrence are the Southern Hairy, Downy, and Red-bellied Woodpeckers, Crested Flycatcher, Red-eyed Vireo, Parula, Sycamore, and Kentucky Warblers, Florida Yellow-throat, Carolina Wren, Tufted Titmouse, Carolina Chickadee, and Blue-gray Gnatcatcher. There is, of course, more or less local variation to be considered in this connection.

Occasionally an undergrowth of dogwood, haw, deciduous holly, and possibly one or two rarer shrubby growths occurs in heavy woods of the prevailing character. Here, again, the Hooded Warbler is plentiful, and frequently the Kentucky Warbler. If a growth of switch cane (*Arundinaria tecta*) is also present, it proves very attractive to both these species, and seems to supply an indispensable condition for the presence of Swainson's Warbler, which, however, is seldom found even where the switch cane occurs. Where the distinctive woodland has these undergrowths, the Wood Thrush is most apt to occur as a breeder.

The summer bird-life of the delta region presents several further aspects as seen in the cypress swamps, in the marshes of the immediate coast district, and in the midst of cultivation and about the edges of the swamps and woods. Although the cypress occurs in practically all situations throughout the section under consideration, heavy swamps of this tree occupy rather restricted areas. Their interest from an ornithological point of view is small. Their principal nesting inhabitants are the Woodpeckers, the Green-crested Flycatcher, and the Prothonotary, Parula, Sycamore, and Hooded Warblers, of which the Sycamore and Prothonotary Warblers are the most conspicuous.

The marshes of southeastern Louisiana present no especial peculiarity. Red-winged Blackbirds and Boat-tailed Grackles are abundant in nearly all situations. The Florida Yellow-throat is uniformly distributed; the Long-billed Marsh Wren and Louisiana Seaside Sparrow are somewhat local in their occurrence. In

small numbers, the Orchard Oriole is thoroughly at home in the marshes, especially where bushy growths occur, and in such places in fact various other species not primarily marsh birds may be found. This is particularly true of the Yellow-billed Cuckoo, Kingbird, Cardinal, White-eyed Vireo, Titmice, Mockingbird, Carolina Wren, and Blue-gray Gnatcatcher.

The sugar, rice, and trucking industries of lower Louisiana have effected, of course, certain very decided modifications in the nature of the growths. About the edges of most sugar plantations there is usually more or less land that has been roughly cleared in anticipation of its final cultivation. The rank productiveness of such soil, commingles in one astonishing mass of confusion the native lesser growths of the woods, and the escapes from the pastures, the ditches, and the railroads. Willow, button bush, elder, blackberry, tall coarse weeds, bindweeds, grasses, sedges, leguminous plants both native and introduced, and all the common native vines make almost impenetrable thickets. Even where introduced plants have gained small foothold, the growths are always more tangled on the edges of the fields than in the woods, and in either case, the bird-life is about the most profuse to be discovered in summer. The Yellow-breasted Chat is attracted almost exclusively to spots of this description. The plantation bird-life adds at least half a dozen other species to those occurring in summer by virtue of the native constitution of the country. In this category may be placed the Kingbird, Meadowlark, Cowbird, Indigo Bunting and Bluebird, which are commonest towards the western and northern limits of the delta region. The same is true of the Dickeissel, which, however, is much rarer than the others. The Painted Bunting is reasonably common in all localities, but most so towards the west. The distribution of the Summer Tanager throughout this region is decidedly irregular; there are few spots of woodland suited to its habits and it occurs most frequently among the groves of towns and plantations. The Wood Pewee has somewhat the same distribution. The Towhee is more or less common in summer about the edges of the woods except in the wetter localities. Considered with reference to the delta region as a whole, however, it can hardly be called a well established breeder there.

Before proceeding to the consideration of the relation of migration to this region, it will be well to give a list of the land birds breeding there, summarizing the preceding remarks: Resident species are indicated by an R: Bob-white, R; Wild Turkey (?); Mourning Dove, R; Turkey Buzzard, R; Black Vulture, R; Swallow-tailed Kite; Mississippi Kite; Sharp-shinned Hawk (?); Florida Red-shouldered Hawk, R; Bald Eagle, R; American Osprey, R; American Barn Owl, R; Florida Barred Owl, R; Florida Screech Owl, R; Great Horned Owl, R; Yellow-billed Cuckoo; Belted Kingfisher, R; Southern Hairy Woodpecker, R; Downy Woodpecker, R; Pileated Woodpecker, R; Red-headed Woodpecker (local), R; Red-bellied Woodpecker, R; Flicker, R (rare in summer); Nighthawk (rare as a breeder in this region except towards the west); Chimney Swift, Ruby-throated Hummingbird, Kingbird, Crested Flycatcher, Wood Pewee, Green-crested Flycatcher, American Crow, R; Fish Crow, R; Blue Jay (distribution rather local), R; Cowbird, R; Red-winged Blackbird, R; Southern Meadowlark, R; Baltimore Oriole (occurs rarely as a breeder about the northern limit of the region); Purple Grackle (is resident about Baton Rouge); Florida Grackle, R; Boat-tailed Grackle, R; Grasshopper Sparrow (commonest towards the north and west); Louisiana Seaside Sparrow, R; Lark Sparrow (?); Field Sparrow (nests about Baton Rouge and possibly elsewhere); Towhee, R; Cardinal, R; Indigo Bunting; Painted Bunting; Dickcissel; Summer Tanager; Purple Martin; Rough-winged Swallow (commonest towards the north and west); Loggerhead Shrike (if it breeds in this region, it does so with extreme rarity); Red-eyed Vireo, Warbling Vireo (is decidedly local; common at New Orleans, and probably at other points on the Mississippi); Yellow-throated Vireo (may breed about the northern limit of the delta region); White-eyed Vireo; Prothonotary Warbler; Swainson's Warbler (positive evidence of the nesting of this species in the section under consideration is lacking); Parula Warbler; Yellow Warbler (occurs rarely as a breeder about the northern limit of this section); Sycamore Warbler; Kentucky Warbler; Florida Yellow-throat, R; Yellow-breasted Chat; Hooded Warbler; Mockingbird; Carolina Wren, R; Long-billed Marsh Wren, R; Tufted Titmouse, R; Carolina Chickadee, R; Blue-gray Gnat-

catcher, R; Wood Thrush; Bluebird, R (local and never very common).

As the writer has discussed the subject of migration in Louisiana at some length in other papers appearing in 'The Auk,' he will merely restate in general terms what has appeared there, and then illustrate with several concrete instances. The substance of this matter is that purely transient species are rare in spring in the delta region, but much commoner in fall. The presence of such forms is limited largely to the latter part of spring, and even then occurs with more or less rarity and irregularity. There are rarely more than two or three days of comprehensive migrational activity between March 15 and April 15. In making many spring expeditions in the vicinity of New Orleans the writer has found it the rule that between the dates mentioned, only resident, summer visitor and lingering winter visitor species will be observed. On one of the seemingly most favorable days I have ever been afield in southern Louisiana, April 6, 1895, the only exclusively transient species I made certain of seeing were the Ovenbird and the Water-thrush! The day was warm and showery, with soft south winds, and seemed to supply exceedingly favorable conditions for migration; the weather was essentially spring-like, of the kind that gives the greatest impetus to the full development of all vernal resources, yet in no wise summery. All the familiar birds were present in great numbers; many, in fact, seemed just to have arrived, and the probability was that there were many transient individuals among those observed; but the fact remained that only a very slightly different element was added to the settled avifauna of the season. Viewed as an example of summer bird-life, however, the species observed were of prime significance. The songs of White-eyed Vireos, Prothonotary, Parula, Hooded, and Kentucky Warblers mingled incessantly; the notes of the Red-eyed Vireo and Sycamore Warbler were somewhat less obtrusive. These species, with the possible exception of the Sycamore Warbler, greatly outnumbered all other forms in the description of country first traversed, the normal moist woodland of the lowlands; but on reaching a tract of slightly higher and more varied woodland, with more undergrowth, we found Crested Flycatchers, Catbirds, and Brown Thrashers, while Summer Tanagers and Wood Thrushes were

unusually plentiful. Here, however, Parula and Hooded Warblers were, if anything, commoner than before, while the two Vireos were present in great abundance. It was in this neighborhood, that the Ovenbirds were seen. There was another species whose presence, chiefly in the open, evidenced that the time for a general passage of transients was ripe. This was the Indigo Bunting. While this species breeds in southeastern Louisiana, it is never common in most localities except during migration; individuals in all stages of plumage, including many old males, were observed. Tree Swallows had reached the height of their spring abundance also, and it is of interest to note that the history of their spring movements reflect very closely many stages of the general vernal advance of birds in southern Louisiana. Though this trip proved so unproductive as an opportunity for the observation of mid-spring transients, the largest number of species yet observed under somewhat similar conditions, and at the same time and place, include only the Black-and-white and Cerulean Warblers and the Redstart as exclusively transient species.

After the middle of April, the conspicuous occurrence of transients is by no means so rare. As explained by the writer in a previous paper, the presence of transients at this season usually occurs with fresher weather. Yet even on these occasions, I have never found any of the transients decidedly and uniformly common except Yellow Warblers, Catbirds, and Gray-cheeked, Olive-backed, and Wilson's Thrushes. At various times I have seen scattering Baltimore Orioles, Rose-breasted Grosbeaks, Scarlet Tanagers, and Black-and-white, Blue-winged, Golden-winged, Tennessee, Magnolia, Cerulean, Chestnut-sided, Bay-breasted, Blackburnian, and Black-throated Green Warblers, and Redstarts, but never the pervading hosts of these species observed at the height of spring in the north. When occurring, these species seldom if ever resort to the ordinary woodland, but usually to the edge of the woods, and to groves and thickets in the midst of cultivation. The extreme refinement of such creatures in their susceptibility to environment during the season of migration was very plainly illustrated to me by an incident which I will relate. On April 21, 1905, I visited a section of country just across the Mississippi from New Orleans, a locality, in fact, which I have explored

with profit on many occasions, and to which I have already referred. The morning was quiet and gray, but about noon a warm south-east breeze sprang up. The conditions of early summer seemed about to settle down upon the country. The expectation of observing any unusual birds seemed small, as, in the light of all previous experience, the weather was scarcely suitable for the movement of late transients. Making my way over the route I had always been accustomed to follow, I found only what I had expected, excepting a few Tennessee Warblers at one spot on the edge of the woods. On the edge of a large sugar plantation, lying at the usual limit of my expeditions through these woods was some newly cleared land, however, and in one place it was bordered by a rather varied thicket that had grown up on the lighter, better drained soil. Water oaks, low live oaks, honey locust, with some hackberry, sycamore, dogwood (*C. stricta*), haw, etc., formed an open wood, with brambles and other moderately thick undergrowth, forming an ideal resort for birds, and not only most of the customary species were found here, but the following ten purely transient forms: Rose-breasted Grosbeak, Scarlet Tanager, Yellow-throated Vireo, Black-and-white Warbler, Worm-eating Warbler, Tennessee Warbler, Chestnut-sided Warbler, Black-throated Green Warbler, Ovenbird, and Redstart. The thicket in which they were found contained familiar trees of the region, but there was an obvious difference between this spot and all the surrounding country. The entire extent of the place was only an acre or so; on two sides it was bordered by cleared land, on a third by a brake of switch cane, and on the fourth by an almost uninterrupted growth of sweet gum, in itself an unusual circumstance for the delta region. Whether this little association of species seen in the thicket was making a sojourn of several days was impossible to decide positively, but the probabilities inclined that way, as the weather had been stable for several days. The incident is unique in my experience.

Autumnal bird-life in the delta region is rather more varied on the whole than is that found in spring. From the latter part of July until November 1, transients of one species or another are nearly always present in considerable numbers. In the earlier part of the season the bulk of these birds are Kingbirds, Barn

Swallows, Black-and-white Warblers, Yellow Warblers, Waterthrushes and Redstarts; later come Indigo Buntings, Magnolia and Tennessee Warblers, Catbirds, and Olive-backed Thrushes, with variable but usually small numbers of Chestnut-sided, Bay-breasted, Blackburnian, and Black-throated Green Warblers. Coastwise, the Bobolink is very common in fall.

The common mixed woodland of the delta region is rather more uninteresting in fall than in spring; by September most of its few characteristic birds have grown inconspicuous; the greatest concourses of birds, summer visitors and transients alike, are to be found then in or near open situations. The Hooded Warbler holds its stations the most closely. The Prothonotary Warbler ranges rather widely as early as July, and in willow-dotted fields I have observed individuals in obvious transient progress during that month. The Parula Warbler is very variable in this respect, though their general tendency is to seek the open even more than during spring and summer. The deep woods in Louisiana, in fact, are never the characteristic situation in which to find this species.

Rank growths of tall weeds, especially elder, goldenrod, and 'blood-weed' (*Ambrosia trifida*), along ditches and about the edges of fields, often prove attractive observing grounds during the fall; warblers seem especially drawn to such places.

It is a strange circumstance that the characteristic woodland of the delta region should harbor at least as many birds in winter as it does in summer; as a matter of fact, there are probably more individuals quartered in these woods in winter than in summer. Woodpeckers, Blackbirds, Goldfinches, White-throated and Swamp Sparrows, Blue-headed Vireos, Orange-crowned and Myrtle Warblers, Titmice, Thrashers, Wrens, Hermit Thrushes, Robins, and Kinglets frequent the bare woods about as freely as they do the open and thickets of partially evergreen vines and bushes, such as wax myrtle, brambles, small oaks, baccharis, and smilax. The only species that will not be found in these woods in winter are those invariably found in fields in other regions: the Meadowlark, Savanna Sparrow, and American Pipit; the Palm Warbler, the Mockingbird and the Bluebird, of course, should be added to this list of exceptions, and probably both the Long-billed and Short-billed Marsh Wrens. The Winter Wren, the House Wren, and

Bewick's Wren are more commonly found about the edges of the woods; any moist ground with low cover is freely haunted by Swamp Sparrows in southeastern Louisiana. The Pine Warbler, which never breeds in the delta region, of course, is not common there even in winter. When occurring, it is usually seen about thickets of deciduous trees.

Before concluding this paper with a consideration of the long-leaved pine flats region in Louisiana and Mississippi, the writer wishes to restate the chief peculiarity of the delta region as being the uniformity of its woodland where undisturbed by agricultural operations, and the lack of variety in its breeding birds. Though the pine flats region presents a naturally more continuous topography than the delta woodland, which is interrupted by marshes and deep cypress swamps, and though it is less affected by agriculture, yet within itself it presents a considerably more varied appearance than the woods of the delta region; this is especially true of the pine flats region in southeastern Louisiana; its strictly indigenous avifauna is likewise more varied if less abundant than that in the delta section. The pine flats region, though low, is scarcely level even at its extreme lower border, and rises gradually northward to the long-leaf pine hills region; consequently, it shows two principal growths; (1) the long-leaf and kindred pines, occupying the greater part of the surface; (2) a mixed growth occurring along small streams and in depressions, and composed chiefly of magnolia (especially the 'sweet bay'), red maple, black gum (*Nyssa*), sweet gum, water oak, holly, wax myrtle, *Cyrilla*, and a variety of ericaceous shrubs, including *Azalea*, *Clethra*, and *Vaccinium*. In some places, dogwood and a variety of oaks dispute the higher ground with the pines. Of the resident species of birds found in this region, several are restricted almost entirely to the pines. These are the Red-cockaded Woodpecker, the Meadowlark, Loggerhead Shrike, Pine Warbler, Brown-headed Nuthatch, and Bluebird.

The summer visitor species of birds found in this region are attracted chiefly to the mixed growths, and, of course, do not differ very materially from those found in the delta region. The Broad-winged Hawk is common; the Nighthawk is rather common, and nests in the open pinewoods; the Chuck-will's-widow is com-

mon in the bottoms; the Chimney Swift is common; the Hummingbird is rare; the Kingbird, Crested Flycatcher, and Wood Pewee are all common, nesting in various situations; the Green-crested Flycatcher nests in the broad-leafed growths in the bottoms; the Orchard Oriole is found about homes and farms; the Summer Tanager is common and uniformly distributed; the Purple Martin is common; the Red-eyed Vireo is common and restricted to broad-leafed growths; the White-eyed Vireo frequents the undergrowth; the Prothonotary Warbler is rather common, as are also the Parula, Kentucky, and Hooded Warblers; few favorable situations for the Sycamore Warbler occur; the Wood Thrush is distributed rather irregularly and is never very common as a nester.

In addition to the resident species previously mentioned in connection with the delta region are the following not found there: Wild Turkey; Cooper's Hawk (?); Sharp-shinned Hawk (?); Chipping Sparrow (uncommon in summer); Brown Thrasher; White-breasted Nuthatch.

There is little doubt that of the summer visitors to the delta region, the Warbling Vireo is entirely absent in the pine flats region; the Painted Bunting is rare; while it is doubtful whether the Purple Grackle, Field Sparrow, and Dickcissel breed in the pine flats region. Other species breeding freely in the delta region have a more restricted summer range in the pine flats region; the Red-winged Blackbird is unusual except on the coast of Mississippi and along the rivers; the Florida Grackle is local and never very common; the Boat-tailed Grackle is found chiefly along the coast of Mississippi; the Florida Yellow-throat finds suitable situations chiefly on the coast of Mississippi and along the rivers; the Long-billed Marsh Wren occurs chiefly along the coast of Mississippi.

The course of the migrations in the pine region is much less erratic than in the delta region; exclusively transient forms are decidedly commoner in spring, and in fall likewise, there is a greater variety of steadily common transient species than in the delta region; in all cases, however, the species occurring as transients are much the same as in the delta region. When present these transients resort chiefly to the broad-leafed growths. Of the species decidedly more common in the pine regions during the migrations than in the delta region, the following should be espe-

cially noted: Alder Flycatcher, Least Flycatcher, Scarlet Tanager, Yellow-throated Vireo, Chestnut-sided Warbler, Blackburnian Warbler, Black-throated Green Warbler, Cerulean Warbler, Prairie Warbler, Redstart, Catbird, Wilson's Thrush and Olive-backed Thrush. Species somewhat less common during migration in the pine flats region are the Indigo Bunting and Tree Swallow.

The winter bird life of the pine region is not essentially different from that of the delta region; the greatest difference appears in the case of the sparrows; the Chipping Sparrow, which is never found in the delta region, and which is only a casual breeder in the pine flats region, becomes very abundant there in winter; the Song Sparrow, which is almost unknown in the delta region is sparsely distributed in the pine flats region; the Junco is found sparingly in the upper part of the pine flats region; the Savanna, Swamp and White-throated Sparrows are very much less common than in the delta region; the Vesper Sparrow is much commoner; the Pine Siskin, Purple Finch, and White-crowned and Fox Sparrows are about equally rare in both sections. The Palm Warbler is commoner in the pine region, especially in Mississippi. The Blue-headed Vireo and Orange-crowned Warbler, two species characteristic of the delta region in winter, are almost entirely absent from the pine flats region, perhaps entirely so in the case of the Orange-crowned Warbler. The Brown Creeper, however, is commoner in the pine region. From the nature of the country, Pipits are necessarily less common in the pine flats region. In all other essential respects, the winter bird life of the two sections is identical. It should be added, that among the winter visitors to the pine flats region as among most other elements of its bird population, the deciduous growths attract the greater variety of species.

UNUSUAL ABUNDANCE OF THE AMERICAN GOSHAWK (*ACCIPITER ATRICAPILLUS*).

BY RUTHVEN DEANE.

REPLACING the notable migration of the Snowy Owl in the winter of 1905-06, we have this season been visited by an unusual influx of these bold robbers of our game and looters of the poultry yard. I believe there has not been such a flight since the fall and winter of 1896-97; when at that time they were particularly abundant in portions of New England, as they have been the present season.

It is reasonable to suppose, as in the case of the owls, that a lack of their favorite food forced them south of their usual range. All specimens examined are reported in good condition, though in some cases the stomachs have been entirely empty. I have obtained most of my information from taxidermists, and to them as well as to others I express my hearty thanks for their assistance and for records of some two hundred and seventy-five specimens.

The S. L. Crosby Co., taxidermists, Bangor, Me., report under date of Feb. 1, 1907, having received from twenty-five to thirty specimens. The first ones were sent in early in the season, the last two on Feb. 1, 1907. This number exceeded any previous year, and nearly all specimens were in adult plumage.

Mr. Wm. Cooper, taxidermist, Milo, Me., writes under date of Feb. 27, 1907, that he had received seven specimens of the Goshawk this winter prior to Dec. 25, 1906, but they ceased coming in after the weather became severe.

Mr. Walter D. Hinds, taxidermist, Portland, Me., writing under date of Feb. 8, 1907, informs me that twenty-five specimens of the Goshawk had been sent to him since Oct. 26, 1906, they having been received from Cape Elizabeth and Damariscotta, Me., Gorham, N. H., and other points. All were adult birds.

Capt. Herbert L. Spinney, Keeper of Seguin Light Station, Me., writing under date of Feb. 15, 1907, states that these hawks have been quite abundant in Sagadahoc County, Me., during the past fall and early winter, and while he had seen only two on Seguin

Island and one on the mainland, he had known of a number seen at other points.

Mr. M. Abbott Frazar, taxidermist, Boston, Mass., writes under date of Feb. 1, 1907, that the present flight of Goshawks had exceeded any in his experience; up to that date he had received over seventy-five specimens for mounting. They were sent in from all over the country, one from as far south as Virginia. Only three of this lot were in immature or in mixed plumage.

Mr. W. P. Conger, taxidermist, Burlington, Vt., in a letter dated Feb. 19, 1907, states that Goshawks have been quite abundant in his locality and that he had received fifteen or more specimens.

Messrs. Angell and Cash, taxidermists, Providence, R. I., have had a very extended experience this season with the Goshawk, and with their usual appreciation of the value of scientific records, have kept careful and accurate data of sixty-five specimens which passed through their hands between Oct. 27, 1906, and Feb. 12, 1907. All of these hawks were received from twenty-two towns within a radius of from three to thirty miles from Providence, R. I., ten from Connecticut, and sixteen from Massachusetts, mostly from localities not far from the Rhode Island border. The exact localities where seventeen of the specimens were taken is not known, but presumably from nearby points in Rhode Island. Mr. Cash writes me that this is the most remarkable flight of Goshawks in his section since 1870, the numbers exceeding those of that date. He also states that hunters have reported a great abundance of Ruffed Grouse, and as examination showed that a large percentage of these hawks had been feeding on this noble game bird, it would seem reasonable to believe that they were attracted by their favorite food.

Of the sixty-five specimens, thirty-five were males and twenty-five females. Sixty were in adult plumage and five in immature dress. The crops of many were filled to the utmost and some hunters who brought in specimens which they had shot, remarked that the hawks appeared inactive after their hearty meals.

A careful examination of the stomachs of forty-eight specimens showed the following results: twenty-eight contained the flesh and feathers of the Ruffed Grouse, in one instance a whole foot being found; five contained the flesh and feathers of the domestic

fowl, four contained partly digested flesh not identified, and the stomachs of eleven were entirely empty. One specimen, a female, killed at North Kingston, R. I., Nov. 12, 1906, when shot was standing on the body of a Ruffed Grouse which she had just killed.

Several instances have been reported showing the ferocity and daring which is so characteristic of this species. Mr. Cash writes that some farmers who had brought in specimens which they had killed, stated that when once a Goshawk succeeded in capturing a fowl from the barn yard he would be sure to return every day or two, so that they were reasonably sure of shooting him sooner or later. In a letter received from Mr. Manly Hardy, Brewer, Me., dated Feb. 18, 1907, in speaking of the abundance of this hawk he writes: "A few days ago a Goshawk came down among the houses near by and captured a tame dove. A week ago a man handed me a specimen which he had just shot in the act of killing a hen, he already having been successful in killing two Plymouth Rocks. In another yard near by a Goshawk had seized a hen, when a woman caught him in her hands, and although she was badly scratched she succeeded in killing him."

Rev. C. W. G. Eifrig, Ottawa, Ont., in writing on winter birds (The Ottawa Naturalist, Vol. XX, Feb. 15, 1906) states, in reference to the Goshawk: "On Oct. 18, a fine large female was shot by a farmer near East Templeton in the act of carrying away a good sized Plymouth Rock rooster. On November 3, a boy shot a nice male near the rifle range, which had just put himself on the outside of a Ruffed Grouse. Mr. E. G. White noticed a pair together near Pembroke, one also in the act of devouring a grouse."

Mr. H. K. Coale, Highland Park, Ill., informs me that in November, 1906, the coachman at a private residence of that town, caught an adult Goshawk in the barn yard, while in the act of carrying off a large hen he had just attacked. The hawk was kept alive and exhibited at the public school and afterwards liberated.

Mr. W. H. Brownson, of Portland, Me., informs me that while observing birds on Cape Elizabeth late in October, and while passing through a field adjacent to a farm-house, he found the skeleton of a domestic fowl. It was picked clean, nothing but the feathers of the head and wings remaining. Mr. Brownson called the attention of the farmer to it, who was, however, well aware how it hap-

pened, for he produced the hawk which he had shot and thrown on the woodpile. It was an adult Goshawk.

Mr. C. E. Dionne, of Laval University, Quebec, in a letter written March 6, 1907, states that the Goshawks have been abundant this winter in his locality. He had examined eight specimens of both sexes, all of which were in adult plumage.

Mr. Cash writes that a female killed at West Mansfield, Mass., Dec. 22, 1906, had descended into a poultry yard, fastened on to a large hen, and in attempting to escape with the prize, collided with a wire netting so forcibly that the scalp was torn away from the base of the bill to beyond the eyes. She was picked up stunned.

Mr. George R. White, Ottawa, Ont., writes under date of Feb. 25, 1907: "The Goshawk was very abundant last fall during the last of October and the beginning of November, large numbers being seen. At Kingston, Ont., regular flights were observed during the first week in November, while they were very common all the month of November."

Mr. J. H. Fleming, Toronto, Ont., writes under date of Feb. 20, 1907, that the Goshawks first reached his territory early in November, 1906, and were still scattered through the Province. He states that this flight was possibly not a quarter as large as that which occurred in 1896 and recorded by him (*Auk*, Vol. XXIV, p. 72), but has lasted longer. All specimens taken were adult birds, and the first arrivals were stuffed with flickers. Mr. Fleming also states that there have been no rabbits in the far north this winter, and the past season has been the worst known in Ontario for Ruffed Grouse.

Mr. Lou J. Eppinger, taxidermist, Detroit, Mich., writes under date of Jan. 31, 1907: "Goshawks are very plentiful and seem to be all over this part of the State. Most of them are in mature plumage, while the few which I received last year were all immature birds."

Mr. W. C. Kæmpfer, taxidermist, Chicago, Ill., informs me that only a single specimen has been received by him from Illinois (Melrose Park, Nov. 30, 1906), a few others having been sent from Wisconsin and Michigan.

Mr. Henry W. Howling, taxidermist, Minneapolis, Minn., under date of Feb. 7, 1907, writes that he rarely receives more than

three or four Goshawks during the fall and winter, but this season fourteen specimens had already been sent in, all but one being in the adult plumage.

Mr. Alexander Calder, taxidermist, Winnipeg, Man., informs me in a letter dated Jan. 18, 1907, that ten Goshawks had been received, the first record being Sept. 8, 1906. The stomachs of those examined contained portions of rabbits and squirrels.

Mr. George E. Atkinson, taxidermist, Portage la Prairie, Man., writes under date of Feb. 11, 1907, that Goshawks had been more abundant this season in Manitoba than for the past nine years.

NOTES CONCERNING CERTAIN BIRDS OF LONG ISLAND, NEW YORK.

BY WILLIAM C. BRAISLIN, M. D.

THE species here referred to have recently been met with as birds of Long Island. Most are recorded because of their rarity. One, the Hermit Thrush, is herewith for the first time definitely announced as a breeding species on Long Island. The evidence is based on the capture of a single specimen of an immature bird just out of the nest, with but little power of flight, at Lake Ronkonkoma. Lake Ronkonkoma lies nearly at the geographical center of Long Island, several miles from the sea. The temperature there is, however, tempered by its influence, both in summer and winter, as the thermometer records, carefully made for a series of years by a medical friend who lives near there, show. The Hermit Thrush is said to breed regularly on Cape Cod. The present record brings its coastal nesting range somewhat further south. Further investigation will probably show that the Hermit Thrush is, though rare, a regular summer resident on Long Island.

Alle alle. LITTLE AUK OR DOVEKIE.—Another specimen (several have been previously recorded by me in 'The Auk') was recently sent from Montauk by Mr. Baker. It was secured on

Hither Plain Dec. 31, 1906. It was driven on the beach and there found by the patrolmen of the Life-saving Service. Mr. Baker wrote me that it came ashore during an unusually heavy southerly storm. It bore marks of having received serious injury in the surf. There were areas of extravasated blood beneath the skin of both the body and the head. Its stomach contained no food.

Nycticorax violaceus. YELLOW-CROWNED NIGHT HERON.—I have recently had the pleasure of examining a specimen of this species belonging to Dr. Henry Heath, a dentist, of this city. The specimen, which has been in his possession since the day it was shot, was taken at Orient. Some years ago while staying at the home of his brother, who lives at that place, the bird was killed by a gunner, who gave it to him in the flesh. The bird was taken, Dr. Heath believes, almost certainly in October, though he admits it may have been September or November, about fifteen years ago. This is the second absolutely authentic specimen taken on Long Island, one having been previously recorded (Chapman, Visitor's Guide to the Local Collection of Birds in the Amer. Museum, 1894, p. 28). About a year ago I was kindly informed by Mr. Roy Latham of Orient of his having recently met with the Yellow-crowned Night Heron at his home at Orient and since learning of Dr. Heath's specimen, as above recorded, I have written Mr. Latham for details, which he has given me, as follows: "The Yellow-crowned Night Heron was first seen on May 4, 1905, in a shallow pond on the Salt Marsh. It was very tame and allowed one to approach to within 50 feet while it was running nimbly, picking up minnows. As I walked nearer it flew to a stake 100 yards away. When I left, it returned and stayed in the pond throughout the day. The pond is a favorite feeding ground of the Black-crowned Night Herons and the Little Green Herons. The second (or the same Yellow-crowned Night Heron) was seen on May 7, 1905, in a sheltered creek near woods. It flew into a tree close by. I studied it well from all points. It was in full plumage. I have seen them in Florida and was surprised and delighted to find this one."

Accipiter atricapillus. AMERICAN GOSHAWK.—Although I have seen quite a number of specimens of this species from Long Island,

and have recorded one or more of these, recent occurrences are regarded as sufficiently interesting to record. Captain James G. Scott sent me an almost perfectly adult female specimen, which was killed at Montauk, November 14, 1906.

***Acanthis linaria*.** LESSER REDPOLL.—Never having previously observed the Redpoll on Long Island, it was with pleasure that two were seen in Prospect Park, Brooklyn on March 5, 1907. The two, observed at close range, were even less timid than the common English Sparrow, as I came within little more than a yard's length of the nearest. They found something to pick at on the snow mounds at the edge of the walk, and as they flew I was interested to note the similarity of flight and call-notes to those of the Goldfinch, for which I might easily have mistaken them under less favorable conditions for observation.

***Hylocichla aonalaschkæ pallasii*.** HERMIT THRUSH.—Mr. Win. Dutcher has related in 'The Auk' (III, 1886, p. 443) the evidence obtained favoring the probable occurrence of this thrush as a summer resident on Long Island, but as no further data appeared in relation to the matter the possibility of its being a breeding species remained problematical. In reply to an inquiry, Mr. Arthur H. Howell kindly wrote me that he has twice heard the notes of what he regarded without doubt as the Hermit Thrush in summer on Long Island, during the time of his collecting here. He had once heard it at Lake Ronkonkoma north of the lake, and again near Coram on the old bicycle path which crosses the center of the island, connecting Port Jefferson and Patchogue. On both occasions the song was heard in the low range of hills running the length of Long Island. To obtain if possible further information regarding the species as a summer resident, Mr. George K. Cherrie and I journeyed to Lake Ronkonkoma on June 9, 1906, whence on foot we covered as much of the ground in the east and north as we were able on that day. The list of species which we made proved most interesting to us. The object of our search was not met with until almost at the end of our stay, when a single immature Hermit Thrush was shot. This was the only thrush of any species and the only individual of this species seen on that date. It was found in a wood of mostly deciduous timber. In the tracts where the pines predominated Prairie Warblers, Mourning

Doves, Blue Jays, and Chewinks were abundant. Twenty-five species of birds were observed. Neither the Wood Thrush nor Wilson's Thrush was seen.

The young bird taken was probably not twenty-four hours out of the nest, in fact it corresponded in every particular with young Hermit Thrushes taken from the nest by Mr. Cherrie in Vermont the preceding season.

Obtaining this young bird, practically a nestling, unable to fly any considerable distance, was satisfactory evidence to us that the Hermit Thrush is a nesting species on Long Island. Our not meeting with adult birds would seem to indicate that on Long Island the Hermit Thrush is equally as shy as elsewhere, and perhaps to an even greater degree. We likewise decided, largely from the same reason — that of our not meeting an adult specimen — that it is but a *rare* summer resident. In this we may be in error. The nature of the ground they occupy here may give the birds need for special caution in exposing themselves, while it is possible that they may occur more commonly in other parts of the island than in the region visited.

SOME CHANGES IN THE CURRENT GENERIC NAMES OF NORTH AMERICAN BIRDS.

BY WITMER STONE.

THE proposed publication of a new edition of the A. O. U. Check-List of North American Birds necessitates a careful review of the nomenclature of our birds, and in order that the names may stand on as firm a basis as possible, the more exhaustive the present investigation may be, the better.

As an effort in this direction I have, during the past year, examined the original publication of practically all the genera of the Check-List; as well as the genera of the birds of the world up to 1830. Dr. C. W. Richmond who, as is well known, has been

verifying bird names and dates of publication for many years, and whose knowledge of the literature is unrivalled, has cordially aided me in every way possible and to him I would express my deep obligations.

My investigations show that the strict enforcement of the Code, especially several recent amendments and alterations, will necessitate a number of changes in generic names, while at the same time it places the genera on a more substantial basis than before. As a matter of future record I present below a list of apparently necessary changes, and discussions of other cases which are at least open to question. Some of these cases have already been published, others are contributed by Dr. Richmond, and the rest have originated in my investigations.

I. OVERLOOKED NAMES OR EARLIER CITATIONS OF CURRENT NAMES.

PODICEPS Lath. 1787 (not 1790), becomes *TACHYBAPTUS* Reich. 1849.—This name first appeared in Latham's *Synopsis of Birds*, Suppl., I, p. 294, the type (first species) being *Colymbus cristatus* Linn. It thus becomes a pure synonym of *Colymbus* of the Check-List and a new name must be employed for the subgenus embracing *P. dominicus* and its allies. This is found in *Tachybaptus* Reichenbach, *Av. Syst. Nat.*, pl. ii, 1849, based on the Little Grebe, *Colymbus ruficollis* Pallas.

SIMORHYNCHUS Merr. 1819, becomes *ÆTHIA* Dumont, 1816.—*Æthia* Dumont, *Dict. Sci. Nat.*, rev. ed., I, suppl. p. 71 (1816), based exclusively upon *A. cristatellus* (*Alca cristatella* Pallas), has clear priority over *Simorhynchus* Merrem based upon the same species.

AYTHYA Boie, 1822, becomes *NYROCA* Fleming, 1822.—Another spelling of the preceding name, viz. *Aethya*, which is given by Dumont on the same page, seems to invalidate Boie's *Aythya* for a group of ducks. The next available name for the latter is *Nyroca* Fleming, *Philos. of Zool.*, II, p. 260, type by tautonomy *Marila nyroca*. There has always been a question of priority between these two names, so that it is satisfactory to have one of them invalidated. The enforcement of the rule of relative page precedence, moreover, leads to the same result.

FULIGULA Steph. 1824, becomes MARILA Oken, 1817.—Oken in *Isis* for 1817, p. 1183, as already pointed out by Dr. Gill,¹ gave names to many generic groups of Cuvier's *Règne Animal*, for which that author had merely used vernaculars. Among them, on p. 1183, is *Marila* for Cuvier's group "Les Millouins," the type of which is *Anas marila* Linn. by tautonomy. This will therefore replace subgenus *Fuligula* of the Check-List, and inasmuch as it is earlier than *Nyroca*, the other subgenus, it will have to be used as the generic name for this group. So in place of *Aythya* with subgenera *Aythya* and *Fuligula* we shall have *Marila* with subgenera *Nyroca* and *Marila*.

CAMPTOLAIMUS Gray, 1841, becomes KAMPTORHYNCHUS Eyton, 1838.—Gray in his *List of the Genera of Birds* 1841, p. 95, proposes *Camptolaimus* in place of *Kamptorhynchus* Eyton, without comment. Baird quotes the latter as a synonym in *Birds of North America*, adding "not of Cuvier" but as neither Dr. Richmond nor I have been able to find any use of this name by Cuvier it would seem that Eyton's name (*Monog. Anat.*, p. 57) must be restored.

CLANGULA Leach, 1819, and HARELDA Stephens, 1824.—It has been recognized that the substitution of *Clangula* Leach for *Glaucionetta* Stejneger and the revival of *Harelda* Steph. for the Oldsquaw, as published in the eighth Supplement to the Check-List, was a mistake since Leach in 1819 (*Ross, Voyage*, App. p. xlviii) based his genus *Clangula* solely upon the Oldsquaw. In Oken's review of Cuvier already mentioned, however, we find on page 1183 the genus *Clangula* established in 1817 on *Anas clangula* Linn., so that in light of this earlier action the names will remain as at present.

QUERQUEDULA Steph. 1824, becomes QUERQUEDULA S. G. Gmelin, 1770.—Originally used in *Reise Russ.*, p. 70; type, by tautonomy, *Q. prima* (*Anas querquedula* L.).

GALLINAGO Leach, 1816, becomes GALLINAGO Koch, 1816.—Koch, *Syst. Baier. Zool.*, I, p. 312; type by tautonomy *G. media* (*Scolopax gallinago* Linn.).

Leach's name is a *nomen nudum* but is in any case antedated by Koch.

¹ Proc. U. S. Nat. Mus., XXVI, p. 965.

COLUMBIGALLINA Boie, 1826, becomes CHÆMEPELIA Sw.—The name *Columbigallina*, usually cited from Boie, was first used by Oken (1817) in the Cuvier review already referred to, and was based upon “La Colombi Gallin” of Levaillant, which is *Columba carunculata* Temm. and Knip, an unidentifiable bird. This name disposed of, we fall back upon *Chæmepelia* Sw., Zool. Jour., III, p. 361, 1827, for the Ground Dove, the type (first species) being *Columba passerina* Linn.

ARDETTA Gray, 1842, becomes IXOBRYCHUS Billberg, 1828.—Billberg, Synop. Faun. Scand., Aves, p. 166, proposed *Ixobrychus* for *Ardea minuta* and *A. stellaris* of Linnæus, the former being the type by the first species rule the name will replace *Ardetta* Gray, 1842, of the Check-List.

IACHE Elliot, 1879, becomes CYNANTHUS Sw. 1827.—*Cynanthus* first appeared in the Philos. Magazine, I, p. 441, 1827, not Zool. Jour., III, p. 357, whence it is usually quoted (*cf.* Oberholser under *Ammodramus* below). The type (first species) is *C. latirostris* Sw. and the name will replace *Iache* Elliot, 1879, of the Check-List which is based upon the same species.

MEGASCOPS Kaup, 1848, becomes OTUS Pennant, 1769.—*Cf.* Stone, Auk, 1903, p. 275.

GLAUCIDIUM Boie, 1826, becomes NOCTUA S. G. Gmelin, 1771.—*Noctua* was first used in a generic sense by S. G. Gmelin, Nov. Com. Sci. Petr., XV, p. 447 (1771), the only species mentioned being “*Noctua minor* Briss.” He states that his bird is rather smaller than that described by Brisson, and from the locality it is clear that it was the *Strix passerinum* of Linnæus. It may be claimed that Brisson’s name was based upon the little owl of southern Europe, *Athena noctua* (Scopoli), but while he no doubt confused the two species, as did Linnæus, the majority of references are identical in the two cases and both names have been restricted to the northern species so far as their application is concerned.

As *Glaucidium* Boie, Isis, 1826, p. 970 is based upon *Strix passerinum* it is obvious that it must become a synonym of the earlier *Noctua* S. G. Gmelin.

TROGON Linn. 1766, becomes TROGON Brisson, 1760.—Type remains the same.

CONTOPUS Cab. 1855, becomes HORIZOPUS Oberh. 1899.—*Cf.* Oberholser, Auk, 1899, p. 331.

COTURNICULUS Bp. 1838, becomes AMMODRAMUS Sw. 1827.—*Cf.* Oberholser Smithson. Misc. Coll., Quart. Issue, III, pt. 1, p. 67.

AMMODRAMUS Sw. 1827, becomes PASSERHERBULUS Mayn. 1895.—In the paper above quoted Mr. Oberholser, finding no name available for the group formerly known as *Ammodramus*, proposed the excellent name *Ammospiza*. Dr. Richmond, however, finds the name *Passerherbulus* proposed for *Ammodramus lecontei*, a member of this genus, by C. J. Maynard, Birds of Eastern N. A., 2d ed., pt. 40, 1895, p. 707, and on grounds of priority it must be adopted.

PIPILO Vieill. vs. HORTULANUS Vieill.—In the introduction to his Oiseaux Amér. Sept., Vieillot used the name *Hortulanus* for three birds, as follows: *H. erythrophthalmus*, *H. albigollis* (*Fringilla albigollis* L. Gm.), *H. nigricollis* (*Fringilla flavicollis* and *Emberiza americana* Gm.), and gave figures of the bills. The last two species are easily identified by the synonyms in brackets but there is no positive clue to the first one, except through the figure. There being no indication of a type for *Hortulanus* the first species is to be selected as such, and the acceptance of the name in place of *Pipilo* will thus depend upon whether or not we consider it recognizable.

HELMINTHOPHILA Ridgw., 1882, becomes VERMIVORA Sw. 1827.—*Cf.* Oberholser, Smithson. Misc. Coll., Quart. Issue, III, pt. 1, p. 66.

GALEOSCOPTES Cab. 1850, becomes DUMETELLA S. D. W. 1837.—Dr. Richmond finds in the Analyst, V, No. XVIII, Jan. 1837, p. 206, a paper by "S. D. W." in which occurs the generic name *Dumetella* based upon *D. felivox* or "Cat Thrush of Latham." Latham really called the Catbird "Cat Flycatcher," but Wilson used "Cat Thrush" (Amer. Ornith., II, p. 90) and so did Stephens (Gen. Zool., X, i, 1817, p. 272). The latter also uses the name *Turdus felivox*. Altogether the name is so obviously based upon the Catbird that it should be adopted in place of the later *Galeoscoptes* which is also antedated by *Spodesilaura* Reichenbach, 1850, Av. Syst. Nat., pl. liii.

CYANECULA Brehm, 1828, becomes CYANOSYLVA Brehm, 1828.—Dr. Richmond calls my attention to this earlier name for *Motacilla suecica* L., proposed by Brehm, Isis, 1828, p. 920.

MERULA Leach, 1816, becomes PLANESTICUS Bp. 1854.—*Merula* Leach, 1816, is a nomen nudum but in any case is antedated by *Merula* Koch, 1816 (Syst. Baier. Zool., p. 242), based upon *Sturnus roseus* L.; Koch's work, as I am told by Dr. Richmond, appearing earlier in the year.

The name *Merula* being thus doubly invalidated we must adopt for the Robin and its allies *Planesticus* Bp., Compt. Rend., XXXVIII, p. 3, 1854; type (first species) *Turdus lereboulleti* Bp. = *Turdus jamaicensis* Gm. There is an earlier name, *Hodoiporus*, proposed by Reichenbach in 1850, Av. Syst. Nat., pl. liii, based on a figure of head, feet, wing, etc., but there is no specific name and the specific identification of the bird is in doubt. It is, however, certainly one of the group formerly called "*Merula*" so that the name may be considered available by some.

OLBIORCHILUS Oberh. 1902, becomes NANNUS Billberg, 1828.—Billberg's genus *Nannus* Synop. Faun. Scand., p. 57, is a substitute for *Troglodites* Cuvier, 1817, Règn. Anim., I, p. 370, the type of which is *Motacilla troglodytes* Linn., and thus has many years priority over *Olbiorchilus*.

II. EQUIVALENT GENERA.

DYSPORUS Illiger, 1811, becomes MORUS Vieill. 1816.—In the introduction to Illiger's Prodrömus he mentions a number of generic names which for one reason or another he declines to accept and for which he proposes substitutes in the body of the work. One of these is *Sula* Briss., for which he proposes *Dysporus*. The two names being synonymous we must seek another subgeneric name for the Gannet, which is found in *Morus* Vieillot, 1816, Analyse, p. 63, based entirely upon *Pelecanus bassanus* Linn.

MERGANSER Brisson, 1760, becomes SERRATOR 'Sprungli' Storr, 1784.—Brisson's *Merganser* and Linnæus's *Mergus* seem to be based upon exactly the same birds and are therefore synonymous. *Serrator* Sprungli, in Storr's Alpenreise, I, p. 74 (1784), seems to be the next name for the Mergansers of authors; type by taxonomy *Mergus serrator* L.

III. NOMINA NUDA OR NAMES NOT PROPOSED IN A GENERIC SENSE.

FREGATA Briss. 1760, becomes FREGATA Lacép. 1799.—Brisson did not use the name in a generic sense.

NYCTICORAX Raf. 1816, becomes NYCTICORAX Forster, 1817.—Rafinesque's name is a nomen nudum. Type (only species), *Ardea nycticorax* L.

BOTAURUS Herm. 1783, becomes BOTAURUS Stephens, 1819.—Hermann did not use the name in a generic sense. This was first done by Stephens, Gen. Zool., vol. XI, p. 592. Type from Forster (first species), *Ardea stellaris* L.

MACRORHAMPHUS Leach, 1816, becomes MACRORHAMPHUS Forster, 1817.—All the new genera in Leach's Catalogue are nomina nuda, but all can be cited from Forster's Catalogue of the next year, where Linnæan equivalents are given, unless some other work intervenes.

PAVONCELLA Leach, 1816, becomes MACHETES Cuvier, 1817, (*Règne Animal*, I, p. 490).—Cuvier's *Règne Animal* was prior to Forster's Catalogue. Type the same.

CALIDRIS Cuvier, 1800, becomes CALIDRIS Ill ger, 1811.—Most of the new generic names of the *Tableau in Leçons Anat. Comp.* are nomina nuda, as they are accompanied only by a vernacular. Where, however, the vernacular was used in the *Tableau Élément.*, 1798, in conjunction with an identifiable binomial name, Dr. J. A. Allen suggests that it should be accepted; the species mentioned becoming the type. Thus while *Calidris* is a nomen nudum, *Regulus* is tenable since it is called "Roitolet" in 1800, and in the *Tableau Élément.*, 1798, we find "Roitolet, *Motacilla regulus* L.," showing exactly what the genus was based upon.

In the same way, while most of Brehm's genera, in his paper in *Isis*, 1828, are nomina nuda, we can retain "*Archibuteo*, Rauchfuss-buzzard," since it is clearly identified in his earlier *Beiträge Vogelkunde*, 1820 — viz., "Der Rauchfussige Buzzard, *Falco lagopus* L."

URUBITINGA Lesson, 1839, becomes URUBITINGA Lafr. 1843.—This name occurs only as a nomen nudum in *Rev. Zool.*, 1839, p. 132. Dr. Richmond gives me as the earliest citation known to

him Dict. Univ. Hist. Nat., II, 1843, p. 786, type "L' Aigle — Autour Urubitinga de Cuvier."

ANTROSTOMUS Gould, 1838, becomes ANTROSTOMUS Bonap. 1838.—The Gould reference is entirely erroneous. Dr. Richmond gives me Bonaparte, Geog. & Comp. List, 1838, p. 8, as the earliest citation, type (first species) *Caprimulgus carolinensis* Gm.

SAYORNIS Bonap. 1854, becomes SAYORNIS "Bp." Gray, 1855.—In Bonaparte's paper, Compte Rendus, XXXVIII, 1854, p. 657, this genus is introduced thus: "*Sayornis nigricans* Bp.," with no description and nothing to indicate what the "*nigricans*" is intended to refer to. It is a nomen nudum and must date from Gray, Cat. Gen. and Subgen. of Birds, 1855, p. 146, where *Tyrannula saya* Bp. is given as the type.

IV. CHANGES DUE TO THE RULE OF TAUTONOMY.

The enforcement of this rule, *i. e.*, "If the name of a genus is the same as the name or synonym of one of its included species, that species shall be the type," fixes absolutely the types of many genera upon species now recognized as such but entails a few changes where other species have been currently selected as types.

PHALAROPUS Briss. 1760, becomes LOBIPES Cuv. 1817.

CRYMOPHILUS Vieill. 1816, becomes PHALAROPUS Briss. 1760.

Tautonomy fixes the types of nearly all the Brissonian genera, as this author was accustomed to call one of his species by the same name that he applied to the genus. In only one instance has this action been ignored in selecting the types of his genera, namely in the case of *Phalaropus*, the usually accepted type of which is *Tringa lobata* L., while the species called *Phalaropus* by Brisson is *Tringa fulicaria* L. By accepting the latter as the type we shift *Phalaropus* to the "Red Phalarope" which thus replaces *Crymophilus* Vieill. For *Phalaropus* of the Check-List we must revive *Lobipes* Cuv. 1817, Règne Anim., I, p. 495, based solely upon *Tringa lobata* L.

CÆLIGENA Less. 1832, becomes CYANOLÆMUS nom. nov.—The species upon which *Cæligena* was originally based (Ind. & Synop. gén. Troch., 1832, p. XVIII), included *Ornismyia cæligena* Lesson, which by tautonomy is the type. Unfortunately *Lampropygia*

Reich. has been used for this bird and its allies and *Cœligena* for *O. clemenciæ*. Replacing Reichenbach's name with *Cœligena*, we leave *O. clemenciæ* without a generic appellation and I propose **Cyanolæmus**,¹ type *Ornismyia clemenciæ* Lesson.

V. ERROR IN SELECTING THE TYPE.

CEOPHLÆUS Cab. 1862, becomes PHLÆOTOMUS Cab. & Heine, 1863.—The Check-List cites *Picus pileatus* L. as the type of *Ceophlæus* Cab. but in the original publication, J. f. O., 1862, p. 176, *Picus lineatus* L. is explicitly given as the type. Therefore if we regard these two species as generically distinct, we must adopt a new name for *Picus pileatus* L. Hargitt, in the British Museum Catalogue, Vol. XVIII, adopts *Dryotomus* from Swainson, Class. Birds, II, p. 308, but, as Dr. J. A. Allen has pointed out to me, this name first appeared in the Fauna Bor. Amer., II, p. 301, where *Picus martius* L. is given as the type, so that it becomes a synonym of *Picus* L. *Phlæotomus* Cab. & Heine, Mus. Hein., IV, p. 102, 1863, based exclusively upon *Picus pileatus* L., is, however, available.

VI. CHANGES DUE TO THE FIRST SPECIES RULE.

In order to definitely fix the types of various composite genera of older authors, the revised Code of Nomenclature of the A. O. U., which has been adopted but not yet published, provides that where no type is indicated in the original publication and where none is implied by the rule of tautonomy, the first species mentioned by the original author shall be taken as the type, except in the case of Linnæan genera where the commonly accepted species shall remain the type. After the changes above indicated have been made we find that there are in the Check-List 121 composite genera with no indication of type species. In 93 of these the commonly accepted type is the first species, and of the others 16 are Linnæan genera. Selecting the first species in each of the remaining twelve genera as the type we shall have to make the following changes.

CYCLORRHYNCHUS Kaup, 1829, becomes PHALERIS Temm. 1820.

PHALERIS Temm. 1820, becomes ALCELLA nom. nov.

¹ κυανεὸς blue, λαιμός throat.

The first species mentioned in the description of *Phaleris* Temm., Man. Ornith., 1820, p. cxii, is *Alca psittacula* Pallas, and this name replaces the later *Cyclorhynchus* based upon the same species.

Subgenus *Phaleris* of the Check-List may be replaced by **Alcella**,¹ type *Alca pygmæa* Gm.

MELANITTA Boie, 1822, becomes PHÆONETTA nom. nov.—The first species under *Melanitta* Boie, Isis, 1822, p. 564, in the original diagnosis is *Anas nigra* L. so that this genus becomes a synonym of *Oidemia* which has the same type. For *Melanitta* of the Check-List I propose **Phæonetta**² type *Anas fusca* L.

ACTITIS Ill. 1811, becomes TRINGOIDES Bp. 1831.—The first species in the original diagnosis of *Actitis* (Ill., Prodrum, 1811, p. 262) is *Scolopax limosa* Linn. so that it becomes a synonym of *Limosa* and we revive *Tringoides* Bp., Saggio, p. 58 (1831), for the Spotted Sandpiper.

TYMPANUCHUS Glog. 1842, becomes BONASA Steph. 1819.—BONASA Steph. 1819, becomes HYLOBRONTES nom. nov.

Bonasa was originally based upon the "Heath-hens," *Tetrao cupido* and *T. umbellus*, Stephens, Gen. Zool., XI (1819), p. 298, and the Prairie Chicken being the first species must be taken as the type. This name having priority will replace *Tympanuchus*, while for *Bonasa* of the Check-List I propose **Hylobrontes**,³ type *Tetrao umbellus* L.

CATHARTES Ill. 1811, becomes RHINOGRYPHUS Ridgw. 1874.—GYPPAGUS Vieill. 1816, becomes CATHARTES Ill. 1811.

The first species mentioned in the original description of *Cathartes* Ill. (Prodrum, 1811, p. 236), is the King Vulture, *V. papa* L., for which the name must be used in place of the later *Gypagus*, while for the Turkey Vulture *Rhinogryphus* Ridgway will be revived.

CONURUS Kuhl, 1820, becomes CONUROPSIS Salvadori, 1891.—The type of *Conurus* by the first species rule is *C. guianensis*, not *C. carolinensis* L. Therefore if we regard the Carolina Parakeet as generically different from the other species of *Conurus*, as

¹ *Alca*, Auk; -ella diminutive.

² *φαῖος* brown, *νηττα* a duck.

³ *ύλη* wood woodland, *βροντης*, a thunderer.

is done by Salvadori in the British Museum Catalogue, XX, p. 203, we must adopt *Conuropsis*, the name he proposed for it.

CYANOSPIZA Bd. 1858, becomes PASSERINA Vieill. 1816.—PASSERINA Vieill. 1816, becomes PLECTROPHENAX Stejn. 1882.

The type of *Passerina* Vieill., Analyse, 1816, p. 30, by the first species rule is the Indigo Bird, *Tanagra cyanea* L., and using the name in this sense, as was done in the original Check-List, we must also revert to *Plectrophenax* Stejn. (Proc. U. S. Nat. Mus., V, p. 33) for the Snow-flake.

ACANTHIS Bechst. 1802 (not 1803), becomes LINARIA Bechst., 1802.—The type of *Acanthis* Borkhausen, Deutschl. Fauna, I, p. 248, 1797, where the name first appeared, is, by the first species rule, the European Goldfinch, *Fringilla carduelis* L.; so that this name becomes a synonym of *Carduelis*. For the Redpolls we must adopt *Linaria* Bechstein, 1802, Ornith. Taschb., type (first species) *Fringilla cannabina* Linn. which is generally regarded as congeneric with *F. linaria*.

The types of several other genera change by this rule but fall upon congeneric species.

The type of ANTHUS is *A. arboreus* Bechst. (*Alauda trivialis* L.).

The type of CARPODACUS is *Pyrrhula rosea* [= *Fringilla rosea* Pallas].

The type of AIX is *Anas galericulata* L.

A reservation of the new code exempts Linnæan genera from the operation of the first species rule, their types being as indicated by Linnæus himself, the best known species. There is general consensus of opinion on all but two of these genera, namely *Tetrao* and *Colymbus*. The type of the former is *T. tetrix* by tautonomy.

With regard to *Colymbus*, Americans take *C. cristatus* as the type and use the term for the Grebes, British and most European authors take *C. arcticus* and fix the name on the Loons. Both species are common Scandinavian birds so that there is no indication of a type by following Linnæus's instructions. Other methods failing we must accept the first species, *C. arcticus*, as the type and use *Colymbus* for the Loons, reviving *Podiceps* Latham, 1797 (*cf. antea*) for the Grebes.

A CARD SYSTEM OF NOTE-KEEPING.

BY A. H. FELGER.

SEVERAL years ago I presented to the readers of 'The Auk' (Vol. XIX, 1902, pp. 189-195, 314) a plan for recording in a condensed form the life history notes of birds. This system provided for the keeping of notes on sheets of paper ruled and cross-ruled in suitable manner, a method of note-keeping that had previously found favor with many ornithologists because thereby one could see at a glance the different species observed during each day as well as the different days that each species was observed. In presenting the above mentioned plan it was my purpose to enlarge upon the system then in general use and present to field ornithologists a system by which not only the number of birds of each species observed each day might be seen at a glance, but also environments, conditions of plumage, stages of moult, indications of mating, indications of nest-building, etc.

Since publishing the above named article I have, for my own use, transformed this sheet system into a card system, which I now desire to place before the readers of 'The Auk' in the hope that by my labors some one besides myself may be benefited.

In this system I use three distinct types of cards, each 3 in. \times 5 in. and of 'medium weight,' which, for convenience of reference here, I shall designate 'condition card' (Fig. 1, card 1), 'barred card' (Fig. 2, card 1), and 'extension card' (Fig. 1, card 2; Fig. 2, card 2). The cards for these plates were not selected with reference to contemporaneity, which I hope will not confuse, but selected with a view to illustrating to better advantage the plan of amplifying notes on the 'extension cards.'

The content and method of arrangement of the subject matter to be placed on the 'condition cards' and 'barred cards' is practically the same as that of the 'headline spaces' and 'sections' respectively of my original system.

The abbreviations used on these cards are defined as follows:—

Loc. = locality.

Plum. = plumage.

- I. M. = number of indications of mating.
I. N-b. = " " indications of nest-building.
N. E. = " " nests with eggs.
N. N. = " " nests with nestlings.
No. Sn. = " seen (not including "No. F." and "Y. W.").
No. Hd. = " heard.
No. F. = " in flocks.
No. M. = " migrating.
Y. W. = " of young on the wing.
No. T. = " taken.
A period placed in front of any number = "about."

For each day's work afield I fill out one of these 'condition cards,' one, in the majority of cases, giving sufficient space to record all notes of the nature indicated on the card that are desired. In case there is not sufficient space on this card to record all desirable data with respect to 'Floral' and 'Faunal Changes,' these notes are continued by the use of index letters onto an 'extension card' as indicated in Fig. 1, cards 1 and 2. The 'Locality' on this 'condition card' is for the general locality over which I have that day worked in distinction from the 'Exact Loc.' in which any species may be found and recorded on the 'barred cards.'

These 'condition cards' are not essential to the system and may be omitted at one's pleasure. Isolated notes taken when going to and from business, or under other adverse circumstances, cannot always be accompanied by notes of contemporaneous conditions, but it is evident that, when the opportunity is given to make such observations, notes on the new insects and other small animals that are about, the new buds and flowers that are out, etc., should be recorded as a most valuable contribution to the study of bird migrations.

The 'barred cards' will also in the majority of cases be found to contain sufficient space to accommodate the notes that should be placed upon them. The spaces within the barred lines are intended for numbers only. If one wishes to enter into descriptions of 'Indications of Mating,' of 'Nest-building,' etc., or to extend any note on the card not within the barred lines, it may easily be done by the use of as many 'extension cards' as are desirable, each being numbered consecutively. See Fig. 2, cards 1 and 2.

In recording notes of certain character, as will appear without explanation to one using this system, it is sometimes of advantage to use only the 'extension card' for the purpose, and not the 'barred card.' For example, if one should write a description

APR 19 1906		1
LOCALITY	<i>Bowles' Lake, Littleton, Colo.</i>	
FLORAL CHANGES	<i>Lilacs are leafing out, cottonwood</i>	A
FAUNAL CHANGES	<i>1 Sand Swift, many Tiger Beetles,</i>	B
WEATHER	<i>Clear and warm.</i>	
TEMPERATURE	<i>Min. 52°, Max. 74°.</i>	
WIND	<i>Mere trace from N.W.</i>	
PRECIPITATION	<i>None.</i>	
TIME OUT	<i>9:15 - 6:30</i>	
METHOD OF TRAVEL	<i>Train to Littleton, then afoot.</i>	
SPECIALTY	<i>Note taking.</i>	

APR 19 1906		2
A	<i>buds are bursting, soft maples have cast their scale leaves.</i>	
B	<i>many Carrion Beetles, many Millers, 1 Hornet, many ♂ Mosquitoes, and but 8 Grasshoppers were seen. Field Mice and Gophers show renewed activity. Frogs, first seen Mar. 27th. are now abundant and noisy.</i>	

FIG. 1, CARDS 1 AND 2.

of a bird in abnormal plumage seen in some museum, such description would be placed on 'extension cards' only.

There are other cases of what I call 'compound notes' that occasionally make their appearance in the work of every ornitholo-

gist. A note on a hybrid or a note on the killing of one bird by another would fall under this head. In such a case the names of both birds should be placed at the head of the 'extension card' and the card should be filed under the name of the bird considered of the greater importance in this case. Under the name of the

JUL 5 1906		<i>Xanthocephalus xanthocephalus</i>		1	
EXACT LOC. Sloan's Lake, Denver, Colo.					
ENVIRONMENT In cattails and alfalfa fields.					
PLUM., MOULT Many with some wing and tail feathers out. A					
I. M.	N. E. $\frac{2}{4}, \frac{1}{3}$	No. Sn. .300	No. F. $\left\{ \begin{array}{l} \text{Few ad.} \\ \text{Many juv.} \end{array} \right.$	Y. W. .500	C
I. N-b.	N. N. 9 B	No. Hd.	No. M.	No. T. 1 juv.	
SONGS, CALLS Several full songs, many decultory and choppy, vast majority not singing, only "clucking."					
FOOD Hundreds feeding in alfalfa field, probably on grasshoppers.					

JUL 5 1906		<i>Xanthocephalus xanthocephalus</i>		2	
A One with whole tail gone.					
B 9 ♀s carrying food (apparently grasshoppers) to young.					
C Many still in pairs and several. Hundreds of young on wing in flocks and usually a few adults in each flock. One flock contained .200 juv. and .6 ad ♂s and ♀s. These adults may have belonged to some of the juv. or may have been non-mated.					

FIG. 2, CARDS 1 AND 2.

bird of the lesser importance should be placed a card referring to this note and indicating where it is filed.

The cards are ruled and printed on one side only, the notes being confined wholly to this one side. Any drawings made to

accompany the notes may be placed on the blank sides of the cards, and the same filed with the note cards.

The cards may be arranged in one's file as a whole in chronological order with a 'condition card' leading each day's notes, or, as I myself keep them, the 'barred cards' together with their 'extension cards' may be arranged chronologically according to each species, the 'condition cards' being kept chronologically in a separate file. My own cards are arranged by genera, and within each genus its species, following the same order of sequence as that adopted by the A. O. U. To indicate the positions of genera I use colored ' $\frac{1}{3}$ guide cards' containing the generic names. To indicate the positions of species within each genus I use differently colored ' $\frac{1}{5}$ guide cards' containing the specific names. To indicate the positions of the subspecies I use cards of still different color.

The following cardinal advantages offered by this system may have already occurred to the reader: (1) By the use of these printed forms no note indicated thereon that should be recorded is ever forgotten, as is lamentably the case when the diary system is employed. (2) The system is self indexing. In running over a hundred cards on a certain species that one is studying it is a very simple matter by reference to the 'barred cards' to select those that contain notes on 'mating,' 'nest-building,' or the like. (3) If the cards on any given species are arranged chronologically in a horizontal row, one will have in line before him for very easy study all the notes with reference to any desired phase of the bird's life history that he has ever taken; and this without cataloguing or indexing.

I am convinced that a card system is the only system by which full notes should be kept, and no one, I think, who has had the harrowing experience of indexing and constantly using the diary system will take exception to this statement. The system that I here submit I have given a year's critical trial and am now prepared to recommend it without hesitation to all field workers who endeavor to record copious notes by following a plan that is systematic, readily understood, and easy of reference.

These cards can be made by any printing establishment provided with a ruling machine at a cost considerably below that of

the ordinary 'stock cards' furnished by firms for card catalogue purposes. In large quantities they should be obtained in this way ruled, cut, and printed, for \$1.35-\$1.50 per M.

It is often desirable to have a bird's-eye view of the numbers of birds of each species observed each day in order to study relative dates of arrival and departure, relative abundance, etc. For this purpose I keep on a simple system of quadrille rulings the numbers of the birds of each species seen or heard each day and nothing more, these same numbers appearing on the cards in amplified form in case such species have also been given card records. It frequently happens that enough data are not collected on a given species to entitle it to a card record. To illustrate, if a Hawk were seen flying overhead too far away to determine condition of plumage, stage of moult, etc., and admitting of no note other than a mere record of its occurrence, this record would be placed on the quadrille ruled sheet, and not entered upon a card. I may, at some future date, explain to the readers of 'The Auk' my method of keeping these quadrille ruled sheets.

NOTES ON THE BLACK RAIL OF CALIFORNIA.

BY WILLIAM BREWSTER.

UNDER the name *Porzana Jamaicensis*, var. *coturniculus* Baird¹ Mr. Ridgway, in 1874, described² a Rail said to have been obtained on the Farallones off the coast of California and to differ "from var. *Jamaicensis* of southeastern United States, West Indies and South America, in smaller size, and more uniform colors," the back

¹The name and its authority were thus written originally by Mr. Ridgway. They have since appeared in print in various forms, as *Porzana jamaicensis coturniculus* Baird (Ridgway, Proc. U. S. Nat. Mus., III, 1880, 202, 222), *Porzana jamaicensis*, var. *coturniculus*, "Baird MS." (Baird, Brewer, and Ridgway, Water Birds of North America, I, 1884, 378), *P. jamaicensis coturniculus* Baird (Ridgway, Manual of North American Birds, 1st ed., 1887, 140), *P. coturniculus* Baird (*Ibid.*, 2d ed., 1896, 140), and *Porzana coturniculus* (Ridgw.), (A. O. U Check-List, 2d ed., 1895, 80).

²American Naturalist, VIII, 1874, 111.

being "without white specks." As no additional specimens at all closely resembling the type have since been reported and as the surf-swept Farallones possess no marshes and are otherwise wholly unsuited for the abiding place of any species of Rail, it has come to be questioned if Mr. Ridgway's bird was really taken there — or indeed anywhere in North America. Until very recently Little Black Rails from whatever locality have been so very rare in collections that it has been impossible to bring together a sufficient number of them to show the general range of individual, seasonal and geographical variation to which the species is subject. For this reason the status as well as the habitat of the form *coturniculus* has remained involved in much doubt.

Within the past few years, however, Black Rails which thus far have been called *jamaicensis* have been found abundantly in a few localities on or near the coast of California whence I have received no less than twenty-six of their skins, of which twenty-two were collected by Mr. C. A. Allen at Point Reyes. On comparing these specimens with a somewhat smaller number taken east of the Rocky Mountains I have become convinced that the Black Rail of California is at least subspecifically distinct from that of the eastern United States. The latter has always been regarded as true *jamaicensis*, a ruling which I have no present disposition to challenge, for the only specimen that I have seen from the type locality of the species, Jamaica, appears to differ from the bird of the Atlantic coast region of North America only in having decidedly shorter wings, while it is probable that these were much longer originally, for the tips of the primaries are ragged and apparently rather badly worn.

The type of *coturniculus* has been considered remarkable for its diminutive size, for the extreme attenuation of its bill and for the sparseness—or rather restriction—of the white spotting on its upper parts. Although its back has been described as "without white specks" I have found a very few of them scattered among the interscapular feathers, and they are numerous and rather conspicuous on some of the scapulars and upper tail coverts. It would be more accurate, therefore, to say that the central portion of the back are so slightly spotted as to appear almost immaculate. In this respect, as Mr. Ridgway has pointed out (Proc. U. S. Nat. Mus. XIII, 1890, 311), the type of *coturniculus* resembles *P.*

spilonota (Gould) and *P. sharpei* (Rothsch. and Hart.) of the Galapagos Islands. I have seen no example of true *spilonota*, but two specimens of *sharpei* (from Indefatigable Island) before me have bills quite as stout as those of typical representatives of *jamaicensis*. For this reason I considered it improbable that either of the Galapagos birds can have any very close relationship with the extremely slender-billed type of *coturniculus*.

The majority of my California specimens of the Black Rail are even smaller than the type of *coturniculus* and at least two of them have equally slender bills. In regard to the white markings of their upper parts they vary considerably with age and to a less degree individually. Several birds have the back only sparsely and obscurely spotted, but in no one of them is it so nearly immaculate as in the type of *coturniculus*. Those with the least amount of white are all young, as is the case with my eastern specimens, also. I do not find that there is any constant or even average difference between west and east coast birds with respect to this spotting.

In the light of the evidence just given it seems to me safe to conclude that the specimen of the so-called Farallone Rail, hitherto regarded as unique, is nothing more nor less than a somewhat aberrantly marked but otherwise quite typical, immature representative of the Black Rail which inhabits the mainland of California and is by no means uncommon there — at least locally. This strongly characterized form should therefore bear the name *coturniculus*.

If my view of the matter as above stated be correct it is no longer surprising that the type of *coturniculus* was obtained on the Farallones, for these rocky islands lie due south of, and only about twenty miles distant from, Point Reyes where, as we now know, the California Black Rail occurs numerous in autumn. I am not aware that it has been found breeding in the marshes on this promontory although that it may do so, at least sparingly, seems probable; nor have I knowledge that it ever frequents them in winter. Indeed, the only definite evidence that I possess respecting its seasonal occurrence there is that afforded by letters received from Mr. Allen and by specimens of the birds which he has sent

¹ Proc. U. S. Nat. Mus., XIII, 1890, 311.

me. The dates on which the latter were taken range from October 24 to November 26, 1897.

The Black Rails which inhabit the eastern United States and Jamaica may be easily distinguished from those found in California by the following characters:—

***Porzana jamaicensis* (Gmel.).**

BLACK RAIL.

Larger with stouter deeper bill; the chestnut brown of the upper parts chiefly confined to the nape and nearly or quite wanting on the crown which is plain dark plumbeous or slaty, seldom if ever tinged with chestnut brown even in young birds.

Habitat. West Indies (Jamaica and Cuba) and eastern United States, ranging as far north as Massachusetts and Illinois, as far west as western Kansas. Said to inhabit Middle and South America also.

***Porzana jamaicensis coturniculus* Ridgway.**

CALIFORNIA BLACK RAIL.

Smaller with much slenderer bill; the plumbeous of the under parts deeper, the chestnut brown of the upper parts brighter and more extended, forming a broader patch on the nape and tinging more or less strongly and generally much of the top of the head where there is often no pure unmixed plumbeous or slaty save on the forehead.

Habitat. Coast region of California, occurring abundantly just to the north of San Francisco.

***Porzana jamaicensis* (Gmel.).**

No.	Sex	Locality and Date	Wing	Tar- sus	Culmen from feathers	Depth of bill at base of nostril
3923 ¹	♂	Salem, N. J., June —, 1857,	3.00	.87	.52	.22
48733 ¹	♂	Mt. Pleasant, S. C., Nov. 9, 1906,	2.90	.87	.51	.21
46671 ¹	♂	Key West, Fla., Mch. 11, 1890,	3.05	.91	.57	.24
673 ²	♂	Merrits Inlet, Fla. Apr. 10, 1886,	2.95	.93	.57	.21
674 ²	♂	Cook Co., Ill., May 29, 1885,	2.82	.87	.50	.23
Average			2.94+	.89	.53+	.22+
48695 ¹	♀	Key West, Fla., Apr. 5, 1900,	3.08	.92	.53	.21
11896 ³	♀	Tortugas, Fla., Spring, 1859,	2.91	.85	.54	.22

¹Collection of William Brewster.

²Collection of E. A. and O. Bangs.

³Collection of U. S. Nat. Museum.

No.	Sex	Locality and Date	Wing	Tar- sus	Depth of	
					Culmen from feathers	bill at base of nostril
188738 ²	♀	Dade Co., Fla., Nov. 12, 1901,	3.05	.92	.54	.22
26825 ²	♀	near Spanishtown, Ja., Aug.—, 1862,	2.67	.90	.56	.23
Average			2.93—	.90—	.54+	.22
July or						
48492 ¹	?	Plymouth Harbor, Mass., { Aug., 1869,	3.04	.85	.55	.25
78384 ²	?	Washington, D. C., June 6, 1879,	2.97	.85	.58	.20
97717 ²	?	Piscataway, Md., Sept. 25, 1877,	2.90	.90	.55	.20
149791 ²	?	Rappahannock R., Va., Oct. —, 1906,	2.95	.85	.53	.20
191765 ²	?	Northampton Co., Va., Oct. 14, 1904,	2.95	.85	.53	.21
103588 ²	?	off Pensacola, Fla., Mar. 10, 1885,	2.90	.90	.50	.20
41898 ²	?	western Kansas, Aug. 25, 1865,	2.98	.90	.61	.22
27505 ³	?	Neosho Falls, Kansas, ————	3.02	.83	.53	.21
Average			2.96+	.87—	.55—	.21+
Total average			2.95—	.88+	.54+	.22—

Porzana jamaicensis coturniculus Ridgw.

No.	Sex	Locality and Date	Wing	Tar- sus	Depth of	
					Culmen from feathers	bill at base of nostril
3924 ¹	♂	———, Cal., Jan. —, 1874,	2.63	.79	.58	.17
47680 ¹	♂	Point Reyes, " Oct. 24, 1897,	2.65	.80	.57	.19
47681 ¹	♂	" " " " " "	2.60	.85	.55	.16
47682 ¹	♂	" " " Nov. 9, "	2.66	.85	.59	.14
47683 ¹	♂	" " " " " "	2.72	.85	.52	.19
47684 ¹	♂	" " " " 26, "	2.60	.82	.56	.20
47685 ¹	♂	" " " " " "	2.70	.85	.54	.19
47686 ¹	♂	" " " " " "	2.64	.83	.58	.19
47687 ¹	♂	" " " " " "	2.70	.81	.60	.21
Average			2.65+	.83—	.56+	.18+
47688 ¹	♀	Point Reyes, Cal., Oct. 24, 1897,	2.71	.81	.55	.19
47689 ¹	♀	" " " " " "	2.70	.84	.52	.20
47690 ¹	♀	" " " Nov. 9, "	2.55	.78	.51	.17
47691 ¹	♀	" " " " 25, "	2.55	.77	.52	.20
47692 ¹	♀	" " " " " "	2.60	.70	.52	.17
47693 ¹	♀	" " " " " "	2.59	.76	.50	.16

¹ Collection of William Brewster.² Collection of U. S. Nat. Museum.³ Collection of Mus. Comp. Zoölogy.

No.	Sex.	Locality and Date						Wing	Tar- sus	Culmen from feathers	Depth of bill at base of nostril
47694 ¹	♀	Point	Reyes, Cal.,	Nov. 25,	1897			2.59	.77	.54	.19
47695 ¹	♀	"	"	"	"	"	"	2.59	.74	.54	.20
47696 ¹	♀	"	"	"	"	"	"	2.60	.81	.53	.17
47697 ¹	♀	"	"	"	"	"	"	2.63	.76	.50	.19
47698 ¹	♀	"	"	"	"	"	"	2.68	.78	.52	.18
47699 ¹	♀	"	"	"	"	"	"	2.65	.83	.50	.21
47700 ¹	♀	"	"	"	"	"	"	2.61	.76	.50	.19
47701 ¹	♀	"	"	"	"	26,	"	2.53	.77	.53	.18
3925 ¹	♀	San Francisco,	"	"	—,	1874,		2.53	.78	.52	.17
Average								2.61—	.78—	.52	.18+
45815 ¹	?	Alvisco, Cal.,	Dec. 1,	1892,				2.50	.78	.52	.20
45816 ¹	?	"	"	"	"	"		2.59	.79	.54	.17
Average								2.54+	.78+	.53	.18+
Total average								2.62—	.79+	.54—	.18+

Type of *coturniculus*.12862² ? Farallones, Cal., "Registered"

Oct. 13, 1859,

2.73 .75 .52 .16

If I have dealt at all satisfactorily and conclusively with the matters considered in this article my success has been due very largely to the assistance so kindly given me by the officers of the Smithsonian Institution who, with characteristic liberality, have placed quite at my disposal the entire series of Black Rails contained in the collections under their charge. I am also indebted to my friend Mr. Outram Bangs for an opportunity of examining specimens from his collection which have proved of great service. Had it not been for the free use which I have been permitted to make of all this material, and especially of the precious type of *coturniculus*, I should have been utterly unable to cope with what has been long and justly considered a peculiarly difficult problem.

¹ Collection of William Brewster.² Collection of U. S. Nat. Museum.

GENERAL NOTES.

The Black Tern at Philadelphia, Pa.—On October 20, 1906, returning from an unsuccessful ducking trip behind Petty's Island, in the Delaware River, opposite Philadelphia, we (my brother and myself) observed a Black Tern (*Hydrochelidon nigra surinamensis*) which was flushed from the water about two hundred yards off Williams Street wharf, by a passing tug. It flew slowly up the river, keeping close to the shore, but beyond gunshot. It was plainly visible to us; as we were not over a hundred yards distance from it when it took wing, and the black color and white under tail coverts precluded any possibility of doubt as to its identity.

The Black Tern is given in Stone's 'Birds of Eastern Pennsylvania and New Jersey,' (p. 32) as a "rare or irregular transient" in this vicinity, and in the same book (p. 48) he says, "stragglers have been reported from the Delaware and Susquehanna Rivers," but I can find no records of its occurrence on the former river. Regarding this species in New Jersey, Mr. Stone says (p. 48 of his book), "transient, occurring during the fall migration on the New Jersey coast"; and from this remark I infer that the bird seen by us was one of these transients, driven inland by the stormy weather and northeast winds that prevailed for about a week previous to our observation. Its presence here cannot be attributed to any other cause, which is undoubtedly the true reason of its occurrence.

The Greater Yellow legs (*Totanus melanoleucus*) occurs here only after northeast storms, which also occasionally drive inland other rare species of water birds from the New Jersey coast. The Common Terns (*Sterna hirundo*) are sometimes abundant on the Delaware River above Philadelphia during northeast storms and always disappear after their abatement.

Mr. Stone is correct in considering the Black Tern a "rare or irregular transient" in this vicinity, for it is of such extremely rare occurrence that there is no record of its capture during recent years on the Delaware.—
RICHARD F. MILLER, *Philadelphia Pa.*

Ross's Snow Goose in Colorado.—On December 23, 1906, there was shot on the Kennicott Club Lake, 3½ miles east of Longmont, Colo., a male Ross's Snow Goose (*Chen rossii*). The bird was killed by Capt. Eli, U. S. A., presented by him to Mr. Mart H. Watrous, mounted by Mr. Rudolph Borchardt, and later generously presented by Mr. Watrous to the Colorado Museum of Natural History, Denver, where it may now be seen on exhibition. It was associating with a flock of Mallards (*Anas boschas*), with which it had also been seen by the lake keeper the day before. Two or three days previous to this time the keeper's wife had seen a "flock of white geese about the same size as this one," but whether they were Ross's Geese or not can only be conjectured. I have examined the bird very carefully, comparing it with a specimen from my own col-

lection, and the identity is unquestionable. The commissure is typical and the maxillary tubercles, though not prominent, are present. We thus are able to tally another species for Colorado.—A. H. FELGER, *Denver, Colo.*

The Whistling Swan at Martha's Vineyard, Mass.—Two Whistling Swans (*Olor columbianus*) were shot at Squibnocket, Martha's Vineyard, Mass., by Mr. Gardiner Hammond. One was taken November 28, 1906, and the other the next day, November 29. These specimens are in my collection.—JOHN E. THAYER, *Lancaster, Mass.*

Whistling Swan (*Olor columbianus*) in Massachusetts.—Recent records of the occurrence of the Whistling Swan in this State are sufficiently rare to warrant mentioning the capture of three fine adult specimens on Nantucket on Nov. 29, 1906. A party of sportsmen, consisting of Messrs. J. E. Flynn, H. K. Perkins, and J. H. Ashley of Bridgewater, and L. A. Harvard of Taunton, Mass., while duck shooting from a blind on Tacacha Pond, near Quidnet, Nantucket, saw three large white birds alight in the pond which they at once recognized as swans. They were exceedingly wary at first, but after much patient waiting they finally swam up near enough to risk a shot at long range, and all three of the birds were eventually secured after shooting them over several times, at the expenditure of some seventeen shots.

I saw all three of the birds, on exhibition in a market in Bridgewater, and succeeded in securing one of them, an adult female, for my collection; it measured $51\frac{1}{2}$ inches in length and 84 inches in extent. Another was secured for the Museum of Comparative Zoölogy in Cambridge, and the third was mounted for Mr. J. E. Flynn.—A. C. BENT, *Taunton, Mass.*

***Ardea egretta* in New Mexico.**—In view of the increasing scarcity of all the Egrets the undersigned wishes to put on record the capture of a specimen of *Ardea egretta*, on Nov. 5, 1906. It was shot on the lower part of the Rio Mimbres, about 20 miles above Deming, having been flushed amongst some willows bordering the Canaigre irrigating lake, the altitude of this lake being about 4400 feet; the weather was about freezing. The bird, an adult female, was alone and in excellent plumage.—E. L. MUNSON, *Major, Surgeon, U. S. A.*

Late Occurrence of the King Rail (*Rallus elegans*) in Wisconsin.—Dec. 19 last, a live King Rail (*Rallus elegans*) was brought to me by a boy who had caught it that day in a marsh on the shores of Beaver Dam Lake about two miles from this city. I questioned the lad as to the existence of any open spring of water in the vicinity and he assured me there was none. The rail was seen running through the grass as the boy had skated up to the marshy shore. The bird died the following night and on skinning the specimen I could observe no evidence whatever of an injury of any nature, though the bird was greatly emaciated.—W. E. SNYDER, *Beaver Dam, Wis.*

The Stilt Sandpiper,—a Correction.—On August 13, 1902, I took what I then thought to be a Stilt Sandpiper (*Micropalama himantopus*) on Matenic Island, Knox Co., Maine. The record as such was published in 'The Auk,' January, 1903, p. 65. Upon a more recent examination I find I am in error, and respectfully ask that the same may be corrected.—HUBERT L. SPINNEY, *Seguin Light Station, Popham Beach, Me.*

The American Rough-legged Hawk Breeding in North Dakota,—a Correction.—In the October number of 'The Auk,' 1901 (Vol. XVIII, p. 393), I recorded a supposed instance of the breeding of the American Rough-legged Hawk in Nelson Co., North Dakota. Soon after the publication of this note I examined a series of Ferruginous Roughlegs, in the melanistic phase, and became convinced that my record was erroneous. I should have published more promptly a correction of my error, except for an interesting question, raised by Dr. Louis B. Bishop's experience with some young Roughlegs, as to whether the black Roughlegs were not worthy of recognition as a distinct species, rather than as a mere color phase of *Archibuteo ferrugineus*.

On June 17, 1902, he found, near Lake Washington in North Dakota, a nest of black Ferruginous Roughlegs with four young. He killed the male parent bird and kept the four young alive until July 26, 1902, when all four were in melanistic juvenal plumage. A male and a female were then killed and the other two, also a male and a female, were left with our guide, Mr. Eastgate, to be reared to maturity in captivity. In December, 1902, the female killed and devoured the male; and on August 2, 1903, she was killed and preserved, after she had completed a moult into an adult melanistic plumage. This experience naturally suggested the idea that melanism is hereditary and, if it could be proven that the melanistic birds always breed true, there would be good grounds for supposing that these black hawks might eventually prove to be a distinct species. Pending further investigation and more evidence I postponed the matter; but during the past season we obtained sufficient evidence to overthrow our theory. We secured two young Roughlegs from a nest in Saskatchewan and reared them in captivity, with the interesting result that one developed into a melanistic bird and one into a bird of normal plumage. Whereas a vast amount of evidence would be necessary to prove the validity of a distinct species, this evidence seems to me conclusive as to the correctness of the color phase theory. I am therefore satisfied that the nest I reported in 1901 belonged to a pair of Ferruginous Roughlegs, and I must apologize for my error in recording it.

By way of additional evidence, I might mention another case which came to our notice this past season in Saskatchewan. We found a nest of young Ferruginous Roughlegs on June 27 and saw both parents plainly, one of which was melanistic and one normal. Dr. Bishop visited this nest again on July 24 and flushed from beneath the nest one black and one or two normal young. I am indebted to Dr. Bishop for the use of his notes

in this connection, which I felt that I ought to offer by way of explanation.
— A. C. BENT, *Taunton, Mass.*

The Pigeon Hawk in Wayne Co., Michigan.— Mr. Herbert Spicer secured a Pigeon Hawk (*Falco columbarius*) on P. C. 671, Ecorse Township, Sept. 15, 1906. As an illustration of how easily a rare bird can be disregarded, this hawk was perched on the dead limb of a solitary hickory tree in the center of a buckwheat field and was indulging in a sun bath with wings and tail partly spread. We were passing on a road about 200 yards away. Mr. Spicer thought it a Sharp-shinned Hawk, but I insisted it did not have tail enough and was a female Sparrow Hawk. He was not satisfied; so I waited while he stalked the bird and secured it. I prepared it for my collection and found it a female with stomach empty. I see a hawk or two every year that I consider of this species but do not care to record them as such. The only other positive record is a female secured by me September 13, 1890, in Ecorse Township. The bird was flying across the Detroit River and when first seen was on the Canadian side.— J. CLAIRE WOOD, *Detroit, Mich.*

The Goshawk in Montgomery Co., Virginia.— A week of cold weather early in November last, with the mercury down to 22°, culminated in a blow, and a six-inch snow. During this snowstorm, a Goshawk (*Accipiter atricapillus*) was shot near Blacksburg and sent in to the College to me on Nov. 19, 1906. It was an adult female, in fine blue plumage, a trifle under size, and was quite fat. It is now No. 1362 of my collection. The Goshawk has been recorded from Virginia before, though I know of no very definite record as to time and locality. Dr. Rives, in his 'Catalogue of the Birds of Virginia,' merely says, "Very rare winter visitor," and quotes Coues and Prentiss as to Washington, D. C., occurrences of the species. This record, therefore, may be of some interest.

Every winter for the past sixteen years, I have looked for Crossbills to come here; it was therefore with some satisfaction that on the 16th of January, 1907, I heard and saw a solitary male *Loxia curvirostra minor*, on a small spruce, about twenty feet high, on the campus. It was entirely alone, was feeding on the cones, and uttering its call, and allowed me to walk up to the tree and all around it, to get a good look at it, and I left it there feeding when I was satisfied of the identification. I thought it unnecessary to kill it merely for the record, particularly as the bird ought to be found here every winter. I also have a large series from Yemassee, South Carolina, in my collection.— ELLIS N. A. SMYTH, JR., *Blacksburg, Va.*

The Barn Owl in Massachusetts.— A Barn Owl (*Strix pratincola*) was taken at Weston, Mass., Nov. 14, 1906, by Mr. Charles Merriam. The specimen is now in my collection.— JOHN E. THAYER, *Lancaster, Mass.*

Great Gray Owl (*Scotiapterx nebulosa*).—The general rarity of this species and the irregular intervals of its visits, should warrant a record of all specimens that come to our notice. The following have been captured during the present winter:—

The S. L. Crosby Co., taxidermists, Bangor, Me., have received eight specimens up to Feb. 1, 1907, these being the first sent to them for the past three years.

Mr. Walter D. Hinds, taxidermist, Portland, Me., had received the following up to Feb. 8, 1907. Two from Bailey's Island, Portland Harbor; two from Cape Elizabeth, Me.; and one from Damariscotta, Me. The first specimen was received Nov. 8, 1906.

Mr. W. P. Conger, taxidermist, Burlington, Vt., has received six specimens, with the following data—

1 ♂, Malone, N. Y., Jan. 1, 1907.

1 ♀, Shelburne, Vt., Jan. 2, 1907.

1 ♂, Champlain, N. Y., Jan. 2, 1907.

1 ♀, South Burlington, Vt., Feb. 2, 1907.

1 ♀, Colchester, Vt., Feb. 7, 1907.

1 ♂, Colchester, Vt., Feb. 11, 1907.

Mr. C. E. Dionne, of Laval University, Quebec, under date of March 6, 1907, informs me that he has examined six specimens the past winter.

Rev. C. W. G. Eifrig, Ottawa, Ont., in writing on winter birds (The Ottawa Naturalist, Vol. XX, Feb. 15, 1907) states: "Of the Great Gray Owl, I have seen and heard of four so far this winter, all of which have found their way into the hands of Henry the taxidermist."

Mr. Henry W. Howling, taxidermist, Minneapolis, Minn., had received eleven specimens prior to Feb. 7, 1907.

Mr. J. D. Allen, taxidermist, Mandan, N. Dak., under date of March 11, 1907, writes: "I have never had any Great Gray Owls in the flesh until this winter. Two fine specimens have been received, one from Moorhead and two from Detroit, Minn."—RUTHVEN DEANE, *Chicago, Ill.*

Great Gray Owl (*Scotiapterx nebulosa*) in **Rhode Island**.—Through the kindness of Messrs. Angell and Cash, taxidermists, Providence, R. I., I am enabled to quote the capture of a third specimen for the State. This bird was shot within a mile of the city limits of Providence, on Nov. 19, 1906, and proved to be a male. The two previous records are given in 'Birds of Rhode Island,' Howe and Sturtevant, 1899, p. 62, one specimen taken in 1870 and the other March 25, 1883.—RUTHVEN DEANE, *Chicago, Ill.*

Aggressive Screech Owls.—Mrs. John W. Ames of Cambridge has kindly given me permission to publish the following account of an interesting experience which she had with some Screech Owls at Concord, Massachusetts, in June, 1906. I give it in her own words as follows:—

"I came to Concord to the Manse on June 14. A day or two after my arrival I walked down the avenue after supper and as I stood near the

gate an owl hooted and flew close by my head, and then, after a minute, flew back again. I thought nothing of it, until, a few evenings later, my cook came in much frightened and said she had been hit in the head by a bat. She had been about where I was when the owl flew past me, and her description of the sound it made seemed to make it more probable that it was an owl than a bat. A few days later she was struck again as she walked down the avenue, and both times the skin was broken in several places on the side of her head, and the blow was severe enough to be painful for some days. We soon heard from all our neighbors stories of how, as they passed our gate, the owl flew out and struck them, and almost every evening we could hear some signal of distress from the unwary passers-by, such as, 'Look out for the bird!' or 'What is it? Is it a bat?' One man, I was told, had his eyelids seriously cut.

"One evening as I sat in the house I heard what seemed to be an unusual disturbance among the owls, and I wondered if the young ones might be learning to fly. So I walked down about half way to the gate, with a friend, taking the precaution to put hoods over our heads. We stood there for a few minutes, listening, and then, as it was hot, I dropped back my hood. In an instant, with an angry cry, the owl struck me on the side of the forehead, leaving three or four scratches. I had no time to see the bird, but some days later I had a fairly good view of it, as it flew over me to an elm tree on the hill opposite our house. It seemed to me then to have the appearance and usual size of the Screech Owls which we see often about here.

"One evening, about June 25, a number of people came up, protected by baseball masks or hoods, to investigate the whereabouts of the owl's nest, which appeared to be in the clump of trees along the wall at the foot of the hill, and directly opposite our gate. Two boys in the party threw stones at the trees to start out the owls, and the bird showed off as usual, striking several persons in the head. But the next morning, Mr. Ferguson, who keeps a tub of water for his cow under the trees where the owls seemed to live, brought in the body of an owl which had apparently been drowned, as it was found in the tub. Nobody knows anything of the manner of its death and the boys, whom I questioned, said they did not, to their knowledge, hit any of the owls. But I could not help feeling that the poor bird had been struck by one of their stones, and fallen, stunned, into the water. Since then we have heard nothing of the owls except what appeared to be an unwonted crying of the little ones for the next week or two, and I supposed that they were hungry, for, though they could fly, they probably were not yet trained to find their own food."

I have some further notes concerning this family of owls from Mrs. Alfred Worcester of Waltham who, in company with several friends, visited the Manse on the evening of June 26. The party had provided themselves with fencing masks, which proved useful, as will appear from her account of the experience, which is as follows:—

"As it began to grow dark, I saw something every now and then moving among the trees opposite the entrance to the driveway, and when I crept up I could hear the owls snapping their bills, and spitting like a cat, and snarling. It was lucky I had on the mask, for while I was standing there, straining my eyes and ears, something suddenly swooped down without warning and gave me a hard blow on the side of the head, on the edge of the mask, at the same time uttering a scream of rage. A cousin of Mrs. Hoar's, who also had on a mask, was struck squarely in the face, and at the same moment we heard the scream of rage again. Apparently the hardness of the masks and our not being intimidated made the birds desist, for they did not attack us again, although we saw them fly from tree to tree, and clamber, parrot-like, up an inclined branch, and swing on a hanging one."

Mrs. Worcester adds that a pair of Screech Owls which bred "for a good many years" in a tree standing near a house in Arlington, Massachusetts, developed, in 1902, a habit "of attacking the people who went in and out of the yard, and even those who passed on the sidewalk."—WILLIAM BREWSTER, *Cambridge, Mass.*

The Snowy Owl (*Nyctea nyctea*) not generally Abundant in the Winter of 1906-1907.—I think there has been no record showing an unusual abundance of this species for two consecutive years, and our experience shows that there is a lapse of from five to ten years between these noticeable invasions. In the winter of 1905-1906 we had an unusual abundance scattered over the country, but the present season has been devoid of any remarkable flight south into the United States, though in Manitoba they are reported as abundant as last year. In many sections of the Provinces, New England, and the Middle West, my correspondents who received numbers last winter, have had but few this season, and in some instances none.

The following eleven specimens received by Angell and Cash, taxidermists, Providence, R. I., will be of interest as they record complete data. They were received between November 3, 1906, and February 12, 1907.

Nov. 3, ♂, Newport, R. I.

" 5, ♂, Hope Island, Narragansett Bay, R. I.¹

" 12, ♀, Fisher's Island, N. Y.

" 15, ♀, Monomoy Island, Mass.

" 15, ♀, New London, Conn.²

" 19, ♂, Monomoy Island, Mass.

" 21, ♂, Block Island, R. I.

" 28, ♂, Seaconnet Point, R. I.

" 28, ♀, New London, Conn.³

" 30, ♂, Norwich, Conn.

Feb. 12, ♀, Fisher's Island, N. Y.

¹Contents of stomach, a gray rat, head digested, otherwise whole.

²Contents of stomach, rat fur and bone pellets.

³Contents of stomach, dark flesh and feathers of Black Duck.

Where no mention is made of the contents of stomach it was empty or not examined.

Mr. Alexander Calder, Winnipeg, Man., and Mr. George E. Atkinson, Portage la Prairie, Man., inform me that these owls have been quite as numerous in their localities as they were in the winter of 1905-1906, when they were very abundant.

An interesting feature is that a number of persons who have this season received specimens, report the unusually light plumage, some examples being practically immaculate. Mr. Jas. H. Fleming, Toronto, Ont., writes under date of February 20, 1907, that Snowy Owls reached Toronto early in October (first record Oct. 12), and while the flight was not large, it was remarkable for the wonderful whiteness of the birds. Mr. Fleming states that among a dozen specimens examined there was not a dark one represented, and one taken on November 10, was as nearly spotless as a Snowy Owl can be.

Mr. P. A. Taverner, Detroit, Mich., under date of November 26, 1906, writes:

"This fall I have a few notes on Snowy Owls that you may find of interest.

"Oct. 29, 1906, male, Point Pelee, Ont. This is an almost pure white bird with but half a dozen or so light markings on the breast and a few more a shade darker on inner secondaries and scapularies. Specimen in my collection.

"Nov. 8, 1906, female, Point Pelee, Ont., the usual dark form and the only such bird that I have so far seen this fall.

"Nov. 9, 1906 (about), Port Huron, Mich., almost as white as specimen taken October 29.

"Nov. 9, 1906 (about), Port Huron, Mich., not quite as white as the last but still remarkably so. Both these birds were probably males but were not sexed.

"Nov. 10, 1906, Grosse Isle, Mich., male. Taken a few miles below Detroit. This is one of the very whitest owls I ever saw. Plucking out a few body feathers would make it immaculate.

"This flight is of more than usual interest from the pronounced whiteness of the birds taken. In all previous flights as far as I can gather the birds were of the usual heavily marked type. It shows I think that this flight comes from a different geographical source than previous flights. The only place that I know of where white birds are at all common is the Canadian Northwest, and it therefore looks as if it was from thence that these birds came, via my 'Hyperlaken Route.'"

Mr. J. D. Allen, taxidermist, Mandan, No. Dak., writes under date of March 11, 1907: "The Snowy Owls have not been as abundant in this vicinity during the present winter, as they were a year ago. About twenty specimens have been sent to me, while last winter I received about thirty." Mr. Allen also states that some years ago there was a most remarkable flight of these owls throughout the State and that he

secured over five hundred specimens, and the following year over three hundred and fifty. Since that time they have averaged from ten to forty during the winter season.

I am very much indebted to those who have kindly communicated their observations and should be glad to receive further records from any who may have observed this species within the past few months.—RUTHVEN DEANE, *Chicago, Ill.*

American Hawk Owl (*Surnia ulula caparoch*) in **Rhode Island**—I am indebted to Messrs. Angell and Cash, taxidermists, Providence, R. I., for information regarding the capture of a male Hawk Owl at West Greenwich, R. I., Nov. 16, 1906. The stomach was empty. I think that this may be given as the first authentic record for this species in the State. The only previous citation would seem rather a doubtful record (Birds of Rhode Island, Howe and Sturtevant, 1899, p. 63) as follows: "The only record is of one taken by Mr. W. A. Aldrich (exact locality not known)."—RUTHVEN DEANE, *Chicago, Ill.*

Identity of *Tyrannula mexicana* Kaup.—In his recent paper on the genus *Myiarchus* (Proc. Biol. Soc. Wash., XVII, pp. 21–50, 1904), E. W. Nelson expressed the belief that Kaup's name *Tyrannula mexicana* was based upon the species usually known as *Myiarchus cinerascens*. No changes in current usage were made by him, however, these being deferred until such time as Kaup's type might be examined. While in Germany a few months ago, I therefore took the opportunity to visit the Darmstadt Museum (Grossherzog. Hessisches Museum) and compare this type with recently collected specimens. Dr. G. von Koch of the Darmstadt Museum readily found it for me and kindly extended the courtesies of the museum. for which I am very grateful. The specimen has been on exhibition and its color is considerably altered. The outer tail feathers, so important for comparison, are faded to such an extent that their markings cannot be determined except by very careful examination. In ordinary light, no markings are evident, but by transmitted light the relations of the light and dark areas are reasonably plain, and it may be seen that the dusky on the inner web is confined chiefly to the distal third of the feather and that it broadens across the tip as is characteristic of *cinerascens*. The outer web of the feather also shows a wedge-shaped dusky area. The second and third feathers underlying the outer tail feather are scarcely faded and their markings unchanged. Although not so broadly dusky at the tip as in some specimens, they agree with those of '*cinerascens*' and differ decidedly from '*mexicanus*.' Direct comparisons were made with specimens from the Biological Survey collection selected for the purpose by Mr. Nelson (No. 144872 from Cuernavaca, Morelos, representing '*cinerascens*' and No. 144861 from Minatitlan, Vera Cruz, representing '*mexicanus*'). After making these comparisons, I am convinced that Kaup's type represents the species usually called *cinerascens* and not the

species to which the name *mexicanus* has been generally applied. Thus, it appears that Nelson's suspicions were well grounded and the changes of names suggested by him are necessary. The name *mexicanus* becomes a synonym of *cinerascens* and *cooperi* becomes available for the species recently known as *mexicanus*.—WILFRED H. OSGOOD, *Biological Survey, Washington, D. C.*

White-winged Crossbill at Raleigh N. C.—On February 23 a small flock, roughly estimated to contain about thirty individuals, was observed in Pullen Park, about two miles west of town. The birds seemed quite tame and were working about in the tops of the red cedars, apparently feeding on the cedar berries. Three specimens were collected, two of which, adult male and female, were secured by me in the flesh for our museum. So far as I know, this is the first recorded occurrence of the White-winged Crossbill in North Carolina. My assistant was out again all day yesterday, February 25, in quest of more specimens, but none were seen.—H. H. BRIMLEY, *Curator, N. C. State Museum.*

***Loxia curvirostra minor* in Florida.**—So far as I have been able to ascertain, no record of the occurrence of the American Crossbill in Florida existed prior to December last when Mr. W. W. Worthington collected several specimens on Amelia Island, Nassau County, a few miles below Fernandina. He writes me: "Red Crossbills were common in the pine barrens where I met you that day in the carriage. The first one was taken Dec. 4, 1906. They were common all through December, some flocks seen having at least 50 individuals. Small scattering flocks were seen and were still there on Jan. 16, 1907, when the last were taken."

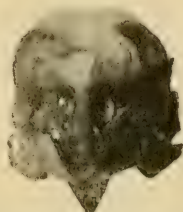
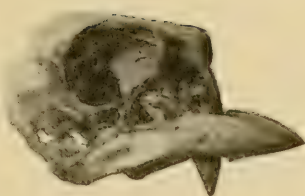
I am obliged to Mr. Worthington for permission to publish this record.—R. W. WILLIAMS, JR., *Tallahassee, Florida.*

The Vesper Sparrow on Long Island, N. Y., in Winter.—On February 12 I observed two or three Vesper Sparrows (*Poæetes gramineus*) at Bellmore, Long Island. It was very difficult to make out the white in the tail against a background of snow, and I had to follow them about and get them against a dark background to make out this mark satisfactorily. Two birds seen February 10, some where between Babylon and Massapequa, which I was unable to identify, I now believe to have been this species.—JOHN TREADWELL NICHOLS, *New York City.*

Malformed Bill of Rose-breasted Grosbeak.—On September 4, 1904, a boy brought to me an adult female Rose-breasted Grosbeak (*Zamelodia ludoviciana*), the bill of which presented a curious malformation. Careful examination shows that the condition was not caused by injury, as there is no trace whatever of a fracture, and the upper mandible has grown strongly downwards. The eye cavity—which in the normal state is

very nearly circular — is forced into a pyriform shape. The malar and squamosal bones are bent almost at right angles, the junction of the angle pressing forcibly against the muscles of the lower mandible. (See illustration.) From the irritated appearance it must have caused considerable pain to the bird.

The entire body was fearfully emaciated and the bird was almost dead. It was absolutely impossible for the bird to have fed itself, and from the appearance of the sides of the mouth it was evident that another bird had been feeding it. A few soft seeds, about the shape of wild rice, though smaller and apparently predigested, were protruding from one side of the mouth, but the bird could not pass them through far enough to swallow them.—FRANK M. WOODRUFF, *Chicago Academy of Sciences, Chicago, Ill.*



Malformed bill of Rose-breasted Grosbeak

Breeding of the Rough-winged Swallow in Berkshire County, Massachusetts.—On July 3, 1906, as I was waiting for a train at the railroad station in Glendale, Berkshire County, Massachusetts, I saw a pair of Rough-winged Swallows flying back and forth over the Housatonic River. Skimming just above the surface of the rapidly flowing water they passed and repassed the station very many times, giving me excellent opportunities for making out their characteristic coloring and markings. Once they alighted on a large, flat-topped boulder at the water's edge where they moved about by a succession of short, quick runs, reminding me of Semipalmated Plover feeding on a sand beach. I have never before seen swallows of any kind move so quickly by the aid of their feet alone. After drinking at a pool of rain water which had collected in a hollow in the rock, these birds took wing again and resumed their regular, coursing flights. They frequently passed under a bridge by which the road from the village to the station crosses the river, and twice they turned sharply upwards and disappeared for a moment among its supporting rafters, which were twenty-five or thirty feet above the water. Suspecting that they might have a nest there I went out on the bridge, but I could not well see under it. On a telephone wire stretched across the river near the bridge I found, however, three young Rough-winged Swallows, fully grown and feathered, clamoring loudly for food, which their parents brought to them every few minutes. I had a fine view of these young birds, for they were perched in full sunlight within ten or twelve yards of me. Probably

there were one or two others of the brood under the bridge, but of this I could not make sure. Two of those on the wire sat facing me, showing very distinctly the rich, reddish brown or fulvous markings on the throat and upper part of the breast, which are so characteristic of the young of *Stelgidopteryx serripennis*. Their plumage was wholly free from down, and their wings and tails appeared to be of full length. They must have been out of the nest for a week or more, but I consider it probable that they were hatched and reared in the immediate neighborhood. Although from the first I had entertained no doubts as to the identity of the old birds, I was glad of the opportunity here afforded for directly comparing them with a number of Bank Swallows which were flying about over the river just above the bridge. Whenever the two species came together it was easy to distinguish them, almost at a glance, for the Rough-wings looked a third larger and very much browner than the Bank Swallows, and they showed no traces of the dark pectoral band so conspicuous in the latter birds.—WILLIAM BREWSTER, *Cambridge, Mass.*

Another Connecticut Warbler from Maine.—The publication by Mr. W. H. Brownson in the last number of 'The Auk' (p. 105) of seven records of the Connecticut Warbler from Maine leads me to record another specimen of this bird which I shot in Eliot, York Co., Maine, on September 12, 1894. This specimen, which was a bird of the year, is now in my collection.—ARTHUR H. HOWELL, *Washington, D. C.*

The Blue-gray Gnatcatcher in Massachusetts.—A male Blue-gray Gnatcatcher (*Poliophtila carulea*) was shot at Hyde Park, Mass., on Sept. 22, 1906, by Frank E. Webster of this town. The bird was alone, feeding in a clump of white birches in a yard. It was very lively in its actions, continually flitting about and now and then uttering a little squeaking note. The skin is now in the collection of Mr. John Thayer, Lancaster, Mass.—H. G. Higbee, *Hyde Park, Mass.*

The Blue-gray Gnatcatcher in Philadelphia County, Pa.—On April 19, 1904, while searching for Song Sparrows' nests in a bunch of nettles at Frankford, this county, I found a dead Blue-gray Gnatcatcher (*Poliophtila carulea*) lying in the weeds. An examination found it badly torn and mutilated, and useless as a specimen; its skull however, was preserved. It had undoubtedly been killed by boys with a sling-shot, as its condition indicated such a fate, and had been dead several days as it was infested with vermin.

The Blue-gray Gnatcatcher is an extremely rare transient in the Delaware Valley, and my record constitutes the first spring record, and the second one of its occurrence in this county. In the enumerated list of specimens in Stone's 'Birds of Eastern Pennsylvania and New Jersey' (p. 148) there is one record for Pennsylvania, and that is the specimen alluded to above, which was taken September 3, 1880, at Chestnut Hill,

by Dr. W. L. Abbott. Stone says (on this page) that it is "only a rare straggler in the Delaware Valley," and on page 32 he considers it as a "rare or irregular transient" in the vicinity of Philadelphia, which indeed it is.

The only other record of its occurrence in the Delaware Valley which I have been able to find is the observation of one by three different persons at Media, Delaware County, Pa., in 1905. This bird, presumably the same individual, was seen on May 1 by Philip H. Moore, on May 2 by Lydia G. Allen, and on May 7 by Alice Fussel. (See 'Cassinia' for 1906, p. 67).

The Blue-gray Gnatcatcher may have been a summer resident in the Delaware Valley in former years, "as there is a very young bird in the collection of the Academy of Natural Sciences, obtained many years ago by Wm. Wood" (Stone's Birds of Eastern Penn., and N. J., p. 148, footnote), but it must now be considered as an extremely rare transient in this vicinity.—RICHARD F. MILLER, *Philadelphia, Pa.*

Two Interesting Nebraska Records.—A male specimen of the Iceland Gull (*Larus leucopterus*) in the first winter plumage was shot by a boy near Dorchester, Nebraska, January 15, 1907, and later was brought to the University for identification. The bird was among a flock of crows when first seen, and was taken for a "white crow." It was easily shot because of its remarkable tameness. This record not only adds a new bird to the Nebraska list, but, I believe, extends the known winter range of the species considerably to the southward, the usual limit in the interior being considered the Great Lake region. The dimensions of this specimen, taken in inches, are: expanse, 47.5; length, 24.5; wing, 16.25; tail, 6.25; chord of culmen, 1.80.

The second record is that of an unusually early appearance of the Bohemian Waxwing (*Ampelis garrulus*) within the State. This bird does not usually reach the latitude of Nebraska until the middle of November, but on October 27, 1906, three specimens were shot from out a flock at the forest reserve near Halsey, Nebraska, and two of these were sent to the University for naming.—MYRON H. SWENK, *University of Nebraska, Lincoln, Neb.*

Autumn Records of Golden Plover and Lapland Longspur in Wayne Co., Michigan.—In the summer of 1906 I was engaged to engineer the laying out of a cemetery on P. C. 40, Springwells Township. As the work was to be according to strictly modern ideas, all the surface dirt was handled, and by autumn the twenty acres was a long narrow piece of smooth barren ground, different from any other piece in that vicinity. This attracted a pair of Golden Plover (*Charadrius dominicus*) October 13, and a flock of fifteen Lapland Longspurs (*Calcarius lapponicus*) November 7. The plover were inspected at 200 feet and the longspurs at less than half that distance through the powerful transit telescope.

While not familiar with all the plumage variations of the Black-bellied and Golden Plover I based my identification on the fact they appeared different from all the Black-bellied Plover I have seen, and had no conspicuous white rump patch.

The longspurs dropped suddenly, like rain from the clouds. They saw me at once and squatted. After an examination through the instrument I approached within about thirty feet of them when one sprang into the air with a twitter and simultaneously the remainder burst into flight, so to speak, and flew beyond the range of vision. November 25, another bird was seen in company with a Prairie Horned Lark. This was in the village of Grosse Pointe Farms. Both the Golden Plover and Lapland, Longspur are considered rare here in autumn.—J. CLAIRE WOOD, *Detroit, Mich.*

Notes from Western New York.—The following records, though not substantiated by specimens, may be worthy of record, as in every case they are of positive identification. The observations were made in the vicinity of Canandaigua, Ontario County, New York, and in a number of cases in conjunction with Mr. Frank T. Antes of Canandaigua.

Sterna caspia.—Six birds of this species in adult spring plumage passed the end of the Canandaigua Lake pier within fair range in the early morning of May 5, 1906. They passed on over the lake in a westerly course till out of sight. There is one other record for Ontario County,—“three specimens at Canandaigua, April 28, 1895.”

Falco peregrinus anatum.—A single bird of this species was observed as it passed over the valley of West River, or the Inlet of Canandaigua Lake, on June 2, 1906. I believe this is the second record of this bird in Yates County.

Nuttallornis borealis.—I recorded a single bird near Mertensia on May 17 and one on May 19, 1906, in the same locality. These are the second and third Ontario County records.

Empidonax flaviventris.—I observed one at Mertensia, May 17, 1906; at Canandaigua, two May 29, and seven June 1, 1906. Of five observed at Canandaigua, May 30, 1906, two were taken by Mr. F. T. Antes. Hitherto there were no records for this species in Ontario County, though it is probably an uncommon but regular migrant.

Melospiza lincolni.—I observed a Lincoln's Sparrow at Canandaigua, May 13, 1906. This is the first record for Ontario County.

Helminthophila pinus.—One observed at Canandaigua by Mr. F. T. Antes on May 13, 1906, is the first Ontario County record.

Helminthophila chrysoptera.—I observed a singing male of this species at Mertensia, Ontario County, on May 17, 1906; and on June 3, 1906, found another male in song at West River, Yates County, where it is very likely the bird breeds. This warbler is recorded as breeding at Naples, Ontario County. This is the second Yates County record.

Helminthophila peregrina.—I observed two in song at Mertensia, May

17, 1906, and one singing bird in Victor, May 22, 1906. These are the first Ontario County records.

Dendroica cerulea.—Mr. F. T. Antes and I observed a male of this species at Canandaigua, May 14, 1906. Though this warbler breeds locally in neighboring counties, I believe this is the first Ontario County record. I observed two at Victor, Ontario County, on May 22, 1906.

Dendroica vigoensis.—On each of the following dates Mr. Antes and I observed a bird of this species at Canandaigua,—April 28, May 6, 7, and 9, 1906. There was no Ontario County record formerly. We observed one on June 2 and another on June 3, both singing, in likely breeding places in the vicinity of West River, Yates County. These are the first records for this county.

Dendroica palmarum.—One observed October 7, 1905, and one May 13, 1906, at Canandaigua, are the first Ontario County records.

Seiurus noveboracensis.—On June 2, 1906, Mr. Antes and I recorded eight birds of this species, seven of which were singing from the swampy woods bordering West River, Yates County. One pair we observed at close range. It would seem that this bird must be a fairly common summer resident there. At Canandaigua the last migrant was observed May 16.

Geothlypis agilis.—Mr. Antes had the good fortune to record a spring migrant of this species at Canandaigua in the early morning of May 29, 1906. He followed up an unfamiliar warbler song to a dense but small thicket. After patient waiting he obtained several very near and convincing views of a male Connecticut Warbler as it sang. Careful searches in the afternoon of the same day and the next morning failed to reveal this warbler in the near vicinity. Early in the morning of May 31, Mr. Antes and I came upon a Connecticut Warbler in an old, overgrown garden about two-thirds of a mile west of the spot where Mr. Antes had observed his bird two days before. Presumably the two observations were of the same bird. While Mr. Antes returned for his gun, I had a half hour in which to study the bird carefully. Its loud song had first made us aware of its presence, and it proved a persistent singer. From a small apple tree in the rear of the garden it flew to a clump of willows standing by itself in an open pasture. I was able to come up to the clump, and, looking within, see the warbler but a few yards from me. The white eye ring was distinct and prominent, and the breast uniform bluish gray. When a pair of Song Sparrows drove it from the clump, it flew to a bushy fence border, and here I had even clearer views of it. Several times I saw it in the act of singing. When Mr. Antes returned it was again back in the thick clump. As it worked towards the edge, he shot. We spent three-quarters of an hour in fruitless search among the close-growing willows, and then gave it up. Though the record is unfortunately not complete, it is none the less positive.

Certhia familiaris americana.—Two singing Brown Creepers observed along West River, Yates County on June 3, 1906, would seem to indicate a strong probability that this bird breeds there.

Poliophtila cærulea.—On April 25, 1906, I observed a female Blue-gray Gnatcatcher at Canandaigua. It was occupied in catching insects that were about the blossoms of a maple tree on the edge of a swampy woods. After some time in the upper branches it came down to about eye level and worked along the border of the woods. This gave me an excellent opportunity to observe it well. It moved on gradually in a northerly direction as if migrating, but apparently was not with a flock of migrants. There is one other record for Ontario County,—“Canandaigua, June 3, 1886.”

Hylocichla guttata pallasii.—Two Hermit Thrushes in song June 2 and two others June 3, 1906, in the vicinity of West River were recorded by Mr. Antes and me. It would seem that this bird is probably a not rare summer resident in Yates County. “Nest found in Yates Co., May 29, 1898.”—MAURICE C. BLAKE, *Hanover, N. H.*

Notes on the Ornithological Works of John James Audubon.—In ‘The Auk’ for July, 1906, pp. 298–312, Mr. Witmer Stone has given a ‘Bibliography and Nomenclator of the Ornithological Works of John James Audubon,’ and it seems to me desirable to publish some additional notes, which, although apparently well known to some persons, seem to have escaped the press.

About ten years ago Mr. Everett W. Ricker of Boston, who has a considerable knowledge of ornithological books, showed me what he considered a complete set of Audubon’s ‘Ornithological Biography’ which he had picked up from time to time. This set consisted of the original five volumes, Edinburgh edition, two Philadelphia editions of Volume I, and a Boston edition of Volume II. With one exception they were in the original bindings. I have obtained from him the Edinburgh edition and he has kindly loaned me the other volumes.

From comparison of various pages, printers’ signatures, and typography, it is evident that both Philadelphia editions of Volume I are from the same press, and doubtless struck off at the same time. It being reasonable to suppose that in those days, before electrotyping was practiced, the type would not remain set any length of time. These sheets were then bound with slightly different title pages and imprints as follows.

Philadelphia: | Juda Dobson, Agent, 108 Chestnut St: | and |

H. H. Porter, Literary Rooms, 121 Chestnut St. |

MDCCCXXXI

Philadelphia: | E. L. Carey and A. Hart, Chestnut St. |

MDCCCXXXII.

In his Bibliography, ‘Birds of the Colorado Valley,’ Coues, after quoting the Edinburgh edition, says: “This same 1st vol. (other copies) is said to also bear the imprint, ‘Philadelphia, E. L. Carey and A. Hart MDCCCXXXII,’ and to be often missing”; and Leverett M. Loomis in ‘The Auk,’ VIII, April, 1891, page 230, refers to “the Edinburgh edition with the Philadelphia title page, (Philadelphia, E. L. Carey and A. Hart,

MDCCCXXXII).” Both these statements doubtless refer to the reprint with this same title page. A glance at the Edinburgh edition, volume I, will show that it differs widely from the others typographically, particularly noticeable on the title page, introduction and index.

The Boston edition of Volume II seems to have been more generally overlooked. However, Coues mentions it after quoting the Edinburgh Volume II and says, “Other copies said to also bear the imprint ‘Boston, Hilliard, Gray and Company, MDCCCXXXV.’ This issue is a reprint typographically distinct from the Edinburgh Volume II, “Entered according to the Act of Congress in the year 1835 by Victor Gifford Audubon and John Woodhouse Audubon in the Clerk’s office of the District Court of the District of Massachusetts.” It is dated on the title page: Boston | Hilliard, Gray and Company | MDCCCXXXV. The few portions of the text which I have examined are identical with the original.

Perhaps more interesting are the various plates of the Elephant Folio which Mr. Stone has reviewed at length. I have seen from time to time several of these plates, evidently from the original coppers, not numbered and bearing no engraver’s signature but in the lower left-hand corner the words, “Drawn from Nature and Coloured by J. J. Audubon F. R. S., F. L. S.” The plates lettered in this manner which I have personally examined are those of Least Stormy Petrel, California Partridge, Canvas-back Duck, and the one figuring Lazuli Finch, Clay Colored Finch and Oregon Snow Finch. These plates are very finely colored and several persons with whom I have talked that have seen them or similar ones share with me the belief that they were probably used for exhibition purposes — F. B. McKECHNIE, *Ponkapog, Mass.*

RECENT LITERATURE.

Chapman’s ‘The Warblers of North America.’¹ — The North American ‘Wood Warblers,’ or family Mniotiltidæ, are here treated monographically from the standpoint of their life-histories, and an attempt is made to set forth our present knowledge of the habits, migrations, breeding and winter ranges of each species and subspecies of this most interesting and attractive family of birds. Each species is illustrated in color from drawings by two of our most skillful bird artists, Fuertes and Horsfall,

¹ The Warblers | of | North America | By | Frank M. Chapman | with the Coöperation of other Ornithologists | With twenty-four, full-page colored plates, illustrating | every species, from drawings by Louis Agassiz Fuertes | and Bruce Horsfall, and half-tones | of nests and eggs | [Monogram] New York | D. Appleton & Company | 1907—8vo, pp. i-viii, 1-306, 24 col. pll., 12 half-tone pll. March, 1907. \$3.00.

and the twelve half-tone plates include characteristic nests of eight species, and 122 figures of eggs. The plan and aim of the work and the manner of its preparation are explained in the 'introduction' (pp. 1-6), where also acknowledgments are made to the thirty-six co-workers who have contributed much valuable and hitherto unpublished material. There is a Chapter on 'Migration' (pp. 14-20) by W. W. Cooke, who has also furnished the very extensive migration tables which form an important feature of the book, and also most of the paragraphs on distribution; the chapter on 'The Food of Warblers' (pp. 23-32) is by E. H. Forbush.

The generalities of the subject occupy some thirty pages (pp. 7-36), and treat, under special subheadings, the general characters, plumage, distribution, migration, songs, nesting habits, food, and the mortality of Warblers. The family Mniotiltidae is stated to contain approximately 155 species, distributed in summer from Argentina to Labrador and northern Alaska, and in winter restricted mainly to the region south of the southern border of the United States. The distribution and probable origin of each genus is considered in detail, the results of the analysis giving prominence to many facts of special interest. Under 'Mortality among Warblers' the death-rate is shown to be relatively high, due mainly to unfavorable conditions encountered during their long migrations; some species, as the Blackpoll Warbler, rarely breeding south of Canada or wintering north of northern South America. The shortest journey of this species, according to Mr. Cooke, is 3,500 miles, "while those that nest in Alaska have 7,000 miles to travel to their probable winter home in Brazil."

The 55 species and 19 subspecies found north of Mexico are treated in systematic sequence, after the following method: (1) the A. O. U. Check-List English and technical names; (2) distinguishing characters of male, female, and young, both in spring and fall (briefly but discriminately presented, and printed in small type); (3) general distribution; (4) summer range; (5) winter range; (6) spring migration; (7) fall migration (with migration tables under each); (8) the bird and its haunts; (9) song; (10) nesting site; (11) nest; (12) eggs; (13) nesting dates; (14) bibliographical references (as cited in the text). The work is thus so detailed and so methodically arranged that any desired topic is readily found. The bibliographical references relate mainly to special articles treating of the habits of the species in question, mostly of recent date, in scientific journals and magazines; the quotations are in the exact words of the author, and are not paraphrases; and specially contributed matter is duly indicated and accredited. The author has been able to draw largely from his own personal knowledge, and little is omitted that could be useful to the reader. Although non-technical, the matter is scientifically all that could be demanded, and is thus not only adapted to the amateur, but is a source of information for the expert. In view of the 124 colored figures, analytical keys are deemed unnecessary. The colored plates have already been published in 'Bird Lore,' where most of the migration matter also originally appeared, but otherwise the work is wholly new.

Taken all in all, 'The Warblers of North America' reaches a high standard of excellence, and sets a model future writers may well emulate. The many excellent colored figures of the birds and beautiful half-tones of nests and eggs admirably supplement the carefully prepared text.—J. A. A.

Alphéraky's 'The Geese of Europe and Asia.'—In the present work¹ are described and figured all of the known species and subspecies of Palearctic Geese, twenty-two in number. The work was originally published in Russian, in 1904, under the title 'Gusi Rossii,' and it is now most welcome in its English dress. The author has evidently enjoyed great opportunities, both in the field and in the amount of material open to him for investigation, as a preparation for the present work, with which he expresses dissatisfaction, inasmuch as he has failed to realize his ideal in respect to its completeness and finality. Yet it is a most important contribution to our knowledge of an imperfectly known field in ornithology.

The generalities of the subject, given in the introduction, are followed by an elaborate key to the genera, species and subspecies, and this by the systematic descriptions, two appendices, and the index. The descriptions of the species, including the various plumages, are very detailed, the bibliographical references are very full, especially to Russian authors, and the geographical distribution and biographies appear to be worked out with great care and thoroughness. The work thus abounds with exceedingly valuable information, not elsewhere given in such connected and convenient form. The author believes Buturlin's subgenus *Melanonyx* to be worthy of generic recognition, and adopts it for the Bean Goose group; he is also liberal in his recognition of species and subspecies, and thus is very attentive to technical details, which adds value to his work, whether or not all his conclusions are accepted. His recognition of differences resulting from age and individual differentiation tend to give confidence in his estimate of the value of differences he ascribes to other causes.

Appendix I is a valuable paper by Mr. G. F. Göbel on the Eggs of Russian Geese, which Mr. Alphéraky says "affords the only satisfactory basis for further oölogical investigations in the subfamily Auserinæ," and deals with the structure of the shell as well as with the color and size of the egg. Tables of the weight (of the shell), the breadth and length of the eggs of the Anserinæ are given as an important aid in determining the species.

¹ The Geese of Europe | and Asia | being a Description of most of the | Old World Species | By | Sergius Alphéraky | Corresponding Member of the Zoological Section of the Imperial Academy of Science, St. Petersburg; | Hon. Member of the Russian Entomological Society; Member of the Imperial | Russian Geographical Society, etc., etc. | With twenty-four coloured plates by F. W. Frohawk | F. E. S., M. B. O. U. | and | frontispiece by Dr. P. P. Sushkin | London: Rowland Ward, Ltd. | "The Jungle," Piccadilly | M C M, V—4to, pp. i-ix, 1-198, col. frontispiece, 24 col. pll., and 16 text figures.

Appendix II is an 'Extract from the Diary of the Visit to Kolguev in 1902 of Mr. S. A. Buturlin,' and contains much interesting information respecting not only the geese of this far-off locality but of its abundant and varied bird life.

Mr. Frohawk's excellent colored plates of the Geese and their bills (three plates of bills) adds greatly to the value and beauty of Mr. Alphéraky's exceedingly important monograph, of interest alike to the ornithologist and the sportsman, and which will long remain a standard source of information on the subject to which it relates.— J. A. A.

Oberholser on Birds from East Africa.¹—About 26 species or subspecies are here listed, with critical comment on most of them. One subspecies is described as new. The comparisons are mainly of Mombara birds with others from Taveta and Mount Kilimanjaro.— J. A. A.

Schiebel on the Phylogeny of the Species of Lanius.—This is an attempt, as explained in the title,² to trace back to a common origin the various species of Shrikes, of which some forty or more species are currently recognized, besides numerous subspecies, by means of coloration resemblances—the pattern of coloration and color, and the coloration of the young in relation to that of the adults. The species can be arranged in sequence, or series, along about seven principal lines, which seem to converge toward a common or ancestral type. Coincidence of certain phases of coloration with particular geographic regions is an interesting feature here brought out. The phylogenetically oldest type, or his 'Typus primitivus,' is found in eastern and Central Asia, and is separable into two groups of species. His 'Typus excubitoriformis' occupies northern Europe, northern Asia, and northern North America. To the west and southwest his 'Typus primitivus' merges into his 'Typus indo-malayicus,' and this again, further south and west, into a 'Typus africanus,' separable into three minor groups.

The subject is discussed in great detail and abounds in points of interest. It is illustrated with eight plates, the first being in black and white to show details of pattern in feather markings; the others are in color, for comparison of pattern and tints in the different groups of species, some thirty species being illustrated by about forty figures, drawn from the side, from cabinet skins, for effective and convenient comparison.— J. A. A.

¹ Notes on Birds from German and British East Africa, By Harry C. Oberholser, Assistant Ornithologist, Depart. of Agriculture. Proc. U. S. Nat. Mus., Vol. XXX, 1906, pp. 801-811.

² Die Phylogense der Lanius Arten. Untersuchungen über die gegenseitige Abstammung sämtlicher Arten der echten Würger auf Grund der Zeichnungsentwicklung der Federkleides. Von Dr. Phil. Guido Schiebel. Journ. für Ornithol., 1900, pp. 1-77 und 161-219, mit 7 farbigen und 1 Schwarzdruck-Tafel und 2 Skizzen im Text. Also separate, Price 8 marks.

Hellmayr on the Types of Little-known Neotropical Birds.¹—The author, in collecting material for his proposed work on the 'Birds of Brazil,' soon found that in order to clear up the uncertainty of nomenclature existing respecting many of the species it would be necessary to examine the original types. "Thus," he says, "during the last four years, I have carefully examined a great number of types in various museums of Europe, and I intend to publish the results of these studies in a series of papers of which this is the first instalment." During the last two years several other papers on the same general subject have already appeared, some of which have been noticed in this journal. In the present paper 64 species are critically considered, in connection with which many nomenclatorial questions are discussed, often involving the detailed revision of specific groups, and new allocations of names. A list of the species treated is given at the end of the paper, showing at a glance the results reached. Dr. Hellmayr's researches in this field are most opportune and should receive cordial welcome.—J. A. A.

Hellmayr on the Birds of Pará, Brazil.—These 'Notes'² relate to a collection of birds received at the Tring Museum from Mr. W. Hoffmanns numbering "420 specimens, representing 120 species, of which no less than 21 are new to the fauna of Pará," while four are new to science, and others represent species previously known only from single specimens. Besides the localities, dates of collecting, and a transcript of the collector's notes on the color of the iris and soft parts, many technical and nomenclatorial notes are also included.—J. A. A.

Wood's Twenty-five Years of Bird Migration at Ann Arbor, Michigan.³—The area is the immediate vicinity of Ann Arbor, and the period, 1880 to 1905, inclusive; the number of species is 267. "The list includes all the species observed in this vicinity, and the record for each species shows whether it is common or rare." The main list forms a sheet 15¾ by 28¼ inches, and is entitled 'Table of First Arrivals,' Two other tabulations are 'Table of Migration Waves,' and 'Table of Species occurring on more than one Wave.' The period of greatest migration occurs the last week in April and the first week in May. The hardier birds, which arrive early, "do not come at a stated time each year, but are governed in their migration to a certain extent by favorable weather and food conditions." The later migrants tend to arrive at about the same time each year, and appear

¹ Critical Notes on the Types of Little-known Species of Neotropical Birds. By C. E. Hellmayr. Part I. *Novitates Zoologicae*, Vol. XIII, July, 1906, pp. 305-352.

² Notes on a Second Collection of Birds from the District of Pará, Brazil. By C. E. Hellmayr. *Nov. Zool.*, Vol. XIII, July, 1906, pp. 353-385.

³ Twenty-five Years of Bird Migration at Ann Arbor, Michigan. By Norman A. Wood. Eighth Annual Report of the Michigan Academy of Science, pp. 151-156, and large folding table.

to be little influenced by weather conditions. Many species arrive with great regularity, irrespective of bird waves. It is believed that through study of weather maps 'bird waves' can be predicted with some certainty.—J. A. A.

Montgomery's 'The Protection of Our Native Birds.'¹—This admirable essay considers, successively, (1) the reason for protection, (2) data on the destruction of birds, and (3) the means for their protection. Under these several divisions the author summarizes the leading features of the subject, especially the value of birds to agriculture. Among the means for the protection of birds, he urges emphatically "the spread of accurate knowledge concerning the practical value of the birds, and especially among farmers. . . . Common-sense talks before farmers' granges and before the meetings of ranchmen may prove more efficacious than printed matter," inasmuch as the bulletins prepared by experts seem rarely to reach the farmers, "being consigned to the waste paper baskets of congressmen." The wide distribution of this important presentation of the subject among the people of Texas should result in much good.—J. A. A.

Oberholser's 'The North American Eagles and their Economic Relations.'²—This is a summary of the distribution and life histories of the Bald Eagle (*Haliaeetus leucocephalus*) and the Golden Eagle (*Aquila chrysaetos*) with a brief allusion to the Gray Sea Eagle (*Haliaeetus albicilla*), which has in North America only a very limited range, being found, so far as known, only in Greenland, on the shores of Cumberland Sound, and on Unalaska Island. The food habits of both the Bald Eagle and the Golden Eagle are considered at length; the former being regarded as "rather more beneficial than otherwise," and the latter as "on the whole more harmful than beneficial." Each species is illustrated by a plate, and the breeding range of each is shown by means of two maps.—J. A. A.

Cooke's the Distribution and Migration of North American Ducks, Geese, and Swans.³—Sixty-four species and subspecies of ducks, geese and swans are stated to occur in North America north of Mexico, of which 24 breed in the United States. Five of the latter are confined to the southern border of the United States and range thence southward, leaving 19 as regular and more or less common breeders over portions of the

¹ The Protection of Our Native Birds. By Thos. H. Montgomery, Jr., Professor of Zoölogy, University of Texas. Bull. University of Texas, No. 79; Scientific Series No. 6, 8vo, pp. 30.

² The North American Eagles and their Economic Relations. By Harry C. Oberholser, Assistant Ornithologist, Biological Survey. Biological Survey, Bull. No. 27—8vo, pp. 31, 2 pl. and 2 text figures, 1906.

³ Distribution and Migration of North American Ducks, Geese, and Swans. By Wells W. Cooke, Assistant, Biological Survey. Biological Survey, Bulletin No. 26, 8vo, pp. 90. 1906.

United States. These are the species that have shown the most marked decrease in recent years, and which, therefore, stand most in need of protection. This investigation was undertaken for the purpose of furnishing information as to present ranges, relative abundance, and migration, with reference to practical legislation. The first part of this valuable report is devoted to a consideration of the extent and causes of the recent decrease in numbers of these useful birds, and the suggestion of measures for their better protection. The absolute prohibition of spring shooting in every part of the country is strongly urged as necessary for the preservation of these species for the benefit of future generations. Then follows a list of species that winter principally in the United States, and a list of those that winter both in the United States and Canada. It is stated that 54 species regularly visit the United States during some portion of the year.

Following this preliminary matter, the species are taken up in systematic sequence, with reference to their breeding ranges, their winter ranges, their seasons and routes of migration. The basis for determining the ranges consists of published records, data derived from museum specimens, and the unpublished notes of the field agents of the Biological Survey. "The data on migration are derived almost entirely from the migration schedules contributed since 1884 to this Bureau by hundreds of observers distributed throughout the United States and Canada." It thus follows that a vast amount of hitherto unpublished information on the ranges and migrations of the Anatidæ is here for the first time available. The paper is thus, aside from its great economic importance, a valuable contribution to ornithology.—J. A. A.

Ward's 'Notes on the Herring Gull and the Caspian Tern.'¹—This is an account of two visits (in 1905 and 1906) to a large breeding colony of Herring Gulls and Caspian Terns at Gravel Island, at the northern end of Door County peninsula, Wisconsin, and contains many interesting observations on the manner of nesting and other matters connected with the home life of these species. The first season many young gulls were found dead on the beach, and the cause of their death was not easy to explain. On the second visit it was found that the old birds deliberately maltreated certain of the young birds, mortally wounding them. "The habit of killing the young," he says, "appears to be fairly common," but he is quite unable to account for such strange acts, which he repeatedly witnessed. "I was quite unable to see," he adds, "that the victims of these attacks were in any way abnormal, or that they had given any offense. . . . Rapid movement seemed always to excite the adults and a running young one was sure to be attacked by every adult near which it passed, but

¹ Notes on the Herring Gull and the Caspian Tern (*Larus argentatus* and *Sterna caspia*). By Henry L. Ward. Bull. Wisconsin Nat. Hist. Soc., Vol. IV, No. 4, October, 1906, pp. 113-134, with 2 plates.

these attacks that came under my observation consisted only of a few jabs of the beak on any part of the body, and none ended seriously." Two half-tone plates give four illustrations of scenes in gull life.—J. A. A.

Game Laws for 1906.¹—This is the usual annual summary of the game laws revised and brought down to date, so as to include not only all the new legislation, but a summary of the more important bills which were considered and failed to pass. It is a condensed statement of the game laws of the United States and Canada, which govern seasons, shipment, sale, licenses, and other limitations, and is of the greatest interest and use to both game protectors and sportsmen, as well as to shippers and dealers in game. The legislation during 1906 was especially important in the Canadian Provinces, five of which passed new game laws, Alberta passing a law prohibiting spring shooting of water fowl. "The passage of the Mississippi statute marks the completion of a chain of nonexport laws in every State of the Union and provision for the appointment of special officers to enforce the game laws in every State except Alabama, Arkansas, and Texas." Several new preserves were established by Congress, and other preserves were made in the Provinces of Alberta and Quebec. Thus is progress made from year to year in the preservation of game almost throughout the continent.—J. A. A.

Forbush's 'Useful Birds and their Protection.'—In this volume² of over 450 pages, with numerous illustrations, we have set before us, by authorization of the Legislature of Massachusetts, one of the most important works yet published relating to the economic relations and protection of birds. By predilection, temperament, opportunities, and familiarity with his subject, the author is well fitted to deal fairly and exhaustively with the important topic here considered—the food relations of birds to agriculture, and hence the utility of birds to man. An introduction of 22 pages deals in a general way with 'The Utility of Birds in Nature,' while the succeeding twelve chapters treat of different phases of the general subject, and with the enemies of birds, and means for their protection. The chapter headings may here be cited as indicating the scope and general character of the work, as follows: 1. The Value of Birds

¹ Game Laws for 1906. A Summary of the provisions relating to seasons, shipment, sale, and licenses. By T. S. Palmer and R. W. Williams, Jr., Assistants, Biological Survey. U. S. Department of Agriculture. Farmers' Bulletin No. 265, 8vo, pp. 54, with maps and tables. Washington Government Printing Office, 1906.

² Useful Birds and their Protection. Containing Brief Descriptions of the more common and useful Species of Massachusetts, with Accounts of their Food Habits, and a Chapter on the Means of Attracting and Protecting Birds. By Edward Howe Forbush, Ornithologist to the Massachusetts State Board of Agriculture. Illustrated by the Author, C. Allan Lyford, Chester A. Reed, and others. Published under Direction of The Massachusetts State Board of Agriculture, by authority of the Legislature.—No date. 8vo, pp. i-xx, 1-437, with 171 text figures, colored frontispiece, and 56 half-tone plates. (Received March 18, 1907.)

to Man; II. The Utility of Birds in Woodlands; III. Birds as Destroyers of Hairy Caterpillars and Plant Lice; IV. The Economic Service of Birds in the Orchard; V. Song Birds of Orchard and Woodland; VI. Songless Birds of Orchard and Woodland; VII. The Utility of Birds in Field and Garden; VIII. Birds of Field and Garden; IX. Birds of the Air; X. Birds of Marsh and Waterside; XI. Checks upon the Increase of Useful Birds; XII. The Protection of Birds.

Chapters I to IV treat of the loss due to insect ravages; the increase and multiplicity of these pests, and their destruction by birds; their increase with the decrease of birds, the utility of birds in the protection of forests, and their "æsthetic, sentimental, and educational value." Chapters V to X take up the various useful birds specifically, giving a short description of each as a means for their identification, and setting forth the rôle each plays in the scheme of nature. In Chapter XI are detailed the various checks upon the increase of birds, including their natural enemies and their destruction by man and the bird enemies introduced by him, as the domestic cat and the House Sparrow. Chapter XII, on the protection of birds, gives instruction as to methods of attracting birds to take up their abodes in cultivated grounds and about our houses, for supplying them with food and nesting facilities, and how to protect crops from such otherwise useful birds as sometimes levy toll on our fruit or grain. There is also something about the artificial propagation of game birds, about the associations organized for the protection of birds, with the names and addresses of their principal officers, and also a bibliography of papers on ornithology published by the Massachusetts State Board of Agriculture from 1861 to date. The text illustrations relate mainly to insect pests (many of which are figured), to their ravages, and to particular species of birds which prey upon destructive insects. The frontispiece is a colored plate, by Fuertes, of the Wood Duck—a species rapidly approaching extinction; the half-tone plates, largely from photographs, illustrate the destructiveness of insects to forests, insect-feeding birds, bird houses and nesting boxes, and other pertinent subjects. Many of these are from published sources, duly acknowledged, but a large number appear here for the first time.

Besides the author's many years of personal field experience in connection with the Gypsy Moth Commission, and in other relations, he has drawn material from the best published sources, as the reports of investigations under the U. S. Department of Agriculture, in relation both to the destructive work of insects upon crops and forests and the utility of birds as insect destroyers, and has utilized the hitherto unpublished reports of two of his field assistants, thus rendering the work an important contribution of new matter to the subject treated. It remains to add that the State Board of Agriculture and the State Legislature of Massachusetts have shown commendable foresight and liberality in authorizing the publication and distribution of an edition of 5000 copies of this valuable exposition of the relation of birds to man's economic interests.—J. A. A.

Dionne's Birds of the Province of Quebec.¹—In 1883, Professor Dionne published in French a volume on the Birds of Canada, having, however, special reference to those of the Province of Quebec. It was, and remained till now, the only systematic work in French treating of the birds of this region. As it has long been out of print, the author has wisely decided to bring out a new work restricted to the birds of this Province, in the form of a popular handbook, with a view to promoting a better general knowledge of the birds of this ornithologically neglected Province. As the author says, little has as yet been done towards making known the local distribution of the birds of this Province, which remains still to a large extent an unexplored field.

Following an introduction of ten pages, the species are taken up in systematic sequence, following the order and the nomenclature of the A. O. U. Check-List, even to the revisions of its latest supplements. Diagnoses are given of the genera and the higher groups, with keys to the latter and descriptions of the external characters of the species and subspecies, followed by biographies, sometimes extending to several pages. The plates furnish half-tone figures of about fifty species (mostly from well-known sources) and there are a number of text cuts. All in all, the 'Birds of the Province of Quebec' is well adapted to meet the great need for a popular handbook, in the French language, of the birds of eastern Canada. — J. A. A.

Clark's Birds of Amherst, Massachusetts.²—The first edition of this little work was published in 1887, and was reviewed in this journal, Volume V, 1888, pp. 105, 106. The number of species then recorded was 179, to which 7 are now added, making 186. The first edition having been long out of print, the present one has been prepared to meet the continued demand for copies. It differs from the former edition in having the species follow each other in a single series, instead of being arranged in three series, in accordance with whether they are of regular, irregular, or of extremely rare occurrence. The 'artificial key' has been rearranged, and a 'field key' added; as already noted seven species are added, and some additions are made to the field notes relating to other species, particularly with

¹ Les Oiseaux | de la | Province de Québec | par | C.-E. Dionne | Maître-ès Arts, Conservateur du Musée Zoologique de l'Université Laval, | Membre associé de l' "American Ornithologists Union," de la "National Geographic Society" Washington, etc. Auteur de "Les Oiseaux | du Canada," du "Catalogue (annoté) des Oiseaux de la | Province de Québec," de "Les Mammifères | de la Province de Québec" [Vignette] Québec | Dessault & Proulx | 1896 — 8vo, pp. i-viii, 1-415, 8 half-tone plates, and 21 text cuts.

² Second Edition: Revised and Rewritten. | — | The | Birds of Amherst | and Vicinity, | including nearly the whole of Hampshire County | Massachusetts. | — | Hubert Lyman Clark. | With an Introduction by | Professor Charles H. Fernald, Ph. D. | — | Amherst: Massachusetts: | Press of Carpenter & Morehouse, | 1906, — 8vo, pp. 96 + 4ll, not paged.

reference to the date of arrival in spring. The purpose of the list, aside from its faunistic value, is to aid local observers in their field studies of birds.—J. A. A.

Cole on Birds from Yucatan.¹—The collections forming the basis of the present paper were made at Chichen-Itza, Yucatan, by Mr. Cole, from February 13 to April 9, 1904, the observation and collection of birds being "rather incidental to the other collecting." The present list is intended "to include every species of bird known to have been definitely reported from Chichen-Itza," and numbers 128 species. The list is based on four sources of information: (1) birds collected by the author; (2) easily recognizable birds (2 in number) added on the authority of Mr. E. H. Thompson, U. S. Consul, owner of a large plantation at Chichen-Itza; (3) a collection of skins (84 specimens, representing 53 species) made by Mr. Thompson in the early nineties; (4) records from other sources, including Mr. F. M. Chapman's list² of 74 species, obtained by him at Chichen-Itza in March, 1896. This is an increase of 54 over Mr. Chapman's list, while 10 of those listed by Mr. Chapman are here given on his authority. A supplemental list of 13 species is given of birds collected or observed elsewhere in Yucatan, not yet reported from Chichen-Itza.

The annotations include, besides the usual field notes, the Maya names, and reports, in the case of a number of species, on the contents of stomachs by Mr. F. S. Millspaw. *Otus choliba thompsoni* is described as new. While *Otus* seems properly to replace *Megascops*, the use of *Asio* in place of *Bubo*, as here and by other writers who are ambitious to be up to date in names, is a little premature, a recent decision on these names by the A. O. U. Nomenclature Committee being to the effect that *Bubo* and *Asio* are entitled to their time-honored associations. Mr. Cole's list is an excellent summary of our present knowledge of the bird-life of Chichen-Itza.—J. A. A.

Proceedings of the Delaware Valley Ornithological Club.—'Cassinia, a Bird Annual,'³ contains, as usual, much of interest relating to the ornithology of Pennsylvania and New Jersey. The opening paper (pp. 1-9) is a biographical sketch of William Bartram, by George Spencer Morris, illustrated with a portrait of Bartram, and a drawing of 'The Bartram House, Bartram's Garden, Philadelphia,' by the author of the paper.

¹ Vertebrata from Yucatan. Introduction and Aves, by Leon J. Cole; Mammalia, by Glover M. Allen; Reptilia, Amphibia, Pices, by Leon J. Cole and Thomas Barbour. Bull. Mus. Comp. Zool. at Harvard College, Vol. L, No. 5, pp. 100-159, pls. 1, 2, November, 1906. Birds, pp. 109-146.

² Bull. Am. Mus. Nat. Hist., VII, 1896, pp. 271-290.

³ Cassinia, A Bird Annual. Proceedings of the Delaware Valley Ornithological Club of Philadelphia, 1906. Issued February, 1907. 8vo, pp. 76, frontispiece and 1 half-tone plate.

Other articles are 'A Study of the Solitary Vireo,' by Cornelius Weygandt (pp. 10-15); 'Summer Birds of Western Pike County, Pennsylvania,' by Richard C. Harlow (pp. 16-25); 'The Concordville Robin and Grackle Roost,' by Samuel C. Palmer (pp. 26-29); 'A June Trip to Pocono Lake, Monroe County, Pennsylvania,' by John D. Carter (pp. 30-34); 'Winter Bird Life in the Pocono Mountains, Pennsylvania,' by William L. Baily (pp. 35-39); 'Report of the Spring Migration of 1906,' compiled by Witmer Stone (pp. 40, 57), arranged in tabular form, and followed by several pages of notes on species not included in the tabular matter. An 'Abstract of Proceedings' (pp. 58-64), a bibliography, 'Bird Club Notes,' and list of officers and members complete this very interesting number. The Club held sixteen meetings during the year, with an average attendance of twenty-four, and a maximum attendance of forty. Few ornithological clubs, if any, in this country can present an equal record of activity and sustained interest in its chosen field as is here reported in 'Cassinia.'—J. A. A.

NOTES AND NEWS.

AUGUST KOCH, an Associate of the American Ornithologists' Union, died suddenly at Mohawk, Florida, Feb. 15, 1907, where he was spending the winter. Mr. Koch was born in Stuttgart, Germany, in 1837, and came to this country with his parents in 1850. His home was at Williamsport, Pa., where he had resided for many years. "As a boy," says 'Forest and Stream' (of March 8, 1907, p. 336), "he was very fond of natural history, and before leaving Stuttgart he had taken lessons in taxidermy from the curator of the Stuttgart Museum. He was an ardent collector of birds, mammals, reptiles, fish and insects up to the time of his death, and was in correspondence with biologists in various parts of America and Europe. A close student of nature, combining manual dexterity with an artistic temperament, the natural history specimens which he mounted were life-like to a degree seldom seen in public collections. He leaves probably the largest, and certainly the finest collection of its kind in Pennsylvania.

"Mr. Koch was an ardent sportsman, a splendid wing shot and a man who had worked out his own code of ethics long before game laws were regarded as of much importance or enforced at all. . . . On the morning of Feb. 15 he was apparently in excellent health, and during the forenoon took a stroll through the woods with his gun. At noon he returned, put away his gun and started to walk across the yard when he was stricken

with cerebral hemorrhage and died instantly. Mr. Koch will be mourned by a wide circle of friends."

Many specimens of rare birds collected by him have found their way to various museums, private and public. He appears to have published little, but it is worth while to call attention to his note, (*Auk*, XVI, 1889, p. 277) on the capture of the Black Seaside Finch (*Ammodramus nigrescens*) near Indianola, Florida, in 1899,—its second record since its original discovery by Mr. Maynard in 1872.

WE REGRET to record that 'The Warbler,' edited and published by Mr. J. L. Childs, Floral Park, N. Y., has been discontinued at the end of the second volume, owing to lack of subscriptions. It contained original matter of scientific value, and was worthy of a better fate. The closing number contains a plate of the nest and eggs of the Blue-throated Hummingbird (*Calligena clemenciae*), and a catalogue (pp. 66–106) of Mr. Childs's ornithological collection, giving all of the species and subspecies of the A. O. U. Check-List, nearly all of which are represented by mounted specimens or by sets of eggs and often by nests. The number and character of the specimens and place and date of collection are indicated by numerals and abbreviations. The rarest species as well as the commoner ones are well represented. The number unrepresented is surprisingly few, showing it to be one of the most complete private collections of mounted North American birds, with their nests and eggs, extant.

ANOTHER popular bird magazine, 'American Ornithology,' published by Charles K. Reed, Worcester, Mass., has also, we regret to say, been forced to suspend publication through insufficient support. Its six volumes are notable for the many excellent half-tone illustrations from nature of birds and their nests and eggs, for its many effective colored plates of North American birds, and much original matter of permanent value.

PROVISION has been made for a Section of Ornithology at the Seventh International Zoölogical Congress, to be held at Boston, August 19 to 25 of the present year. Efforts are being made to induce as many foreign ornithologists as possible to attend the Congress, and it is to be hoped that a large representation of the A. O. U. will be present at the meeting. At this date it is impossible to present any detailed program, but an address will be delivered by a prominent visiting ornithologist, and numerous papers will be presented. All fellows and members of the American Ornithologists' Union are earnestly requested to aid in making the meetings of the Ornithological Section a success, both by their attendance and by presenting papers. Requests for information regarding participation in the Congress, fees, etc., should be addressed to Prof. G. H. Parker, Chairman of the Executive Committee, Cambridge, Mass.; while details of the Ornithological program may be obtained from Mr. Witmer Stone,

Organization Secretary of the Ornithological Section, Academy of Natural Sciences, Logan Square, Philadelphia.

'THE CONDOR' (IX, p. 29) reports that the California Academy of Science's expedition to the Galapagos Archipelago, which left San Francisco June 28, 1905, returned December 1, 1906, after an absence of seventeen months. The leader of the expedition, Mr. R. H. Beck, regards the collections obtained as by far the most extensive ever made at these much-explored islands. Nearly every branch of natural history is represented; and we await with interest the results of the elaboration of this extensive material by specialists.

THE sixth annual session of the Australian Ornithologists' Union was held at Hobart, Tasmania, Nov. 22 and 23, 1906, after which a visit was made to Launceston, from which point excursions were made and field work conducted during the following eight days. It was voted to hold the next annual meeting in New South Wales. The presidential address, by Colonel C. S. Ryan, had for its subject 'The Protection of Native Birds,' and is given in full in 'The Emu' for January, 1907. It contains a review of legislation in America for bird protections, and concludes with various suggestions for better protection of birds in Australia, and especially urges the introduction of bird study in schools, he believing that "to educate people to love birds is better for their protection than many acts of legislation." He advocates a gun tax, a license fee for collectors, and a small bird for farmers and fruit growers, and others who are practically benefitted by birds, and a heavy tax on game vendors and on all who trade in wild birds or their feathers; these tax returns to be used for the payment of 'rangers' or wardens for the protection of State reserves.

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(Continued on 3rd page of Cover.)

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CONTENTS.

	PAGE
THE BIRDS OF CUSTER AND DAWSON COUNTIES, MONTANA. By E. S. Cameron. (Plates V-XII.)	241
THE CROSSBILLS OF NORTHEASTERN WYOMING. By Rev. P. B. Peabody	271
CHARACTERISTIC KAMCHATKAN BIRDS. By Austin H. Clark	278
WINTER BIRD NOTES FROM EXTREME SOUTHERN ILLINOIS. By John F. Ferry	281
ON A COLLECTION OF BIRDS FROM WESTERN COSTA RICA. By Outram Bangs	281
ANOTHER HYBRID HUMMINGBIRD— <i>SELASPHORUS RUFUS</i> + <i>ATTHIS CALLIOPE</i> — FROM CALIFORNIA. By John E. Thayer and Outram Bangs	312
LIST OF THE BIRDS OF LOUISIANA. PART III. By Geo. E. Beyer, Andrew Allison, and Henry H. Kopman	314
AUTUMN WARBLER MIGRATION. By J. Claire Wood	322
A NEW AGELAIUS FROM CANADA. By Harry C. Oberholser	332

GENERAL NOTES.—The Kittiwake (*Rissa tridactyla*) on the Coast of Maine in Summer, 337; The Brown Pelican in Indiana, 337; The Whistling Swan in Northeastern Illinois, 337; The Glossy Ibis in Central New York, 338; Another Specimen of Cory's Bittern, 338; The Little Blue Heron in Philadelphia County, Pa., in Spring, 338; A Woodcock Nesting in St. Louis, Missouri, 339; The Stilt Sandpiper in Massachusetts, 339; The White-rumped Sandpiper in Michigan, 339; Probable Breeding of the Wandering Tattler in the Interior of Alaska, 340; A Correction: Concerning the Occurrence of *Numenius borealis* on Long Island, 341; The English Sparrow in Texas, 341; Lincoln's Sparrow (*Melospiza lincolni*) at Portland, Maine, 341; The Prothonotary Warbler in Colorado, 342; '*Helminthophila lawrencei*' near the District of Columbia, 342; Capture of Lawrence's Warbler near Boston, 343; The Breeding of Brewster's Warbler near Boston, 343; Ten Birds New to the Avifauna of Kansas, 344; A Kentucky Warbler near Boston, Mass., 344; Many Eyes are Better than One Pair, 346; Some Interesting Records from Southern Missouri, 348; Audubon's Ornithological Biography, 349.

RECENT LITERATURE.—Salvin and Godman's 'Biologia Centrali-Americana.—Aves,' 350; Proceedings of the Fourth International Ornithological Congress, 352; Newton's 'Ootheca Wolleyana,' 354; Merzhon's 'The Passenger Pigeon,' 355; Fleming on the Disappearance of the Passenger Pigeon, 357; Report on the Immigration of Birds in England and Wales in the Spring of 1906, 357; Forbes's 'An Ornithological Cross-section of Illinois in Autumn,' 358; Bangs on the Wood Rails, 359; Berlepsch on New Neotropical Birds, 359; Berlepsch on the Tyrannidae, 360; Berlepsch on the Genus *Elenia*, 360; Berlepsch and Stolzmann on Birds from Peru, 361; Jourdain's 'The Eggs of European Birds,' 361; Hartert's 'Die Vogel der Paläarktischen Fauna,' Heft IV, 362; Beebe on the 'Owls of the Nearctic Region,' 362; Woodruff's 'The Birds of the Chicago Area,' 363; Fleming on Migrations of Brunnich's Murre, 364; Lass's 'Bird Life of a City Garden,' 364; Shufeldt on the Osteology of the Tubinares, 366.

NOTES AND NEWS.—Obituary: Alfred Newton, 365; Thomas Henry Douglass, 366. A. O. U. Committee on Nomenclature, 367; New York Zoological Park, 367; Bird Groups in the American Museum of Natural History, 368; E. T. Seton's Expedition to Arctic America, 368.

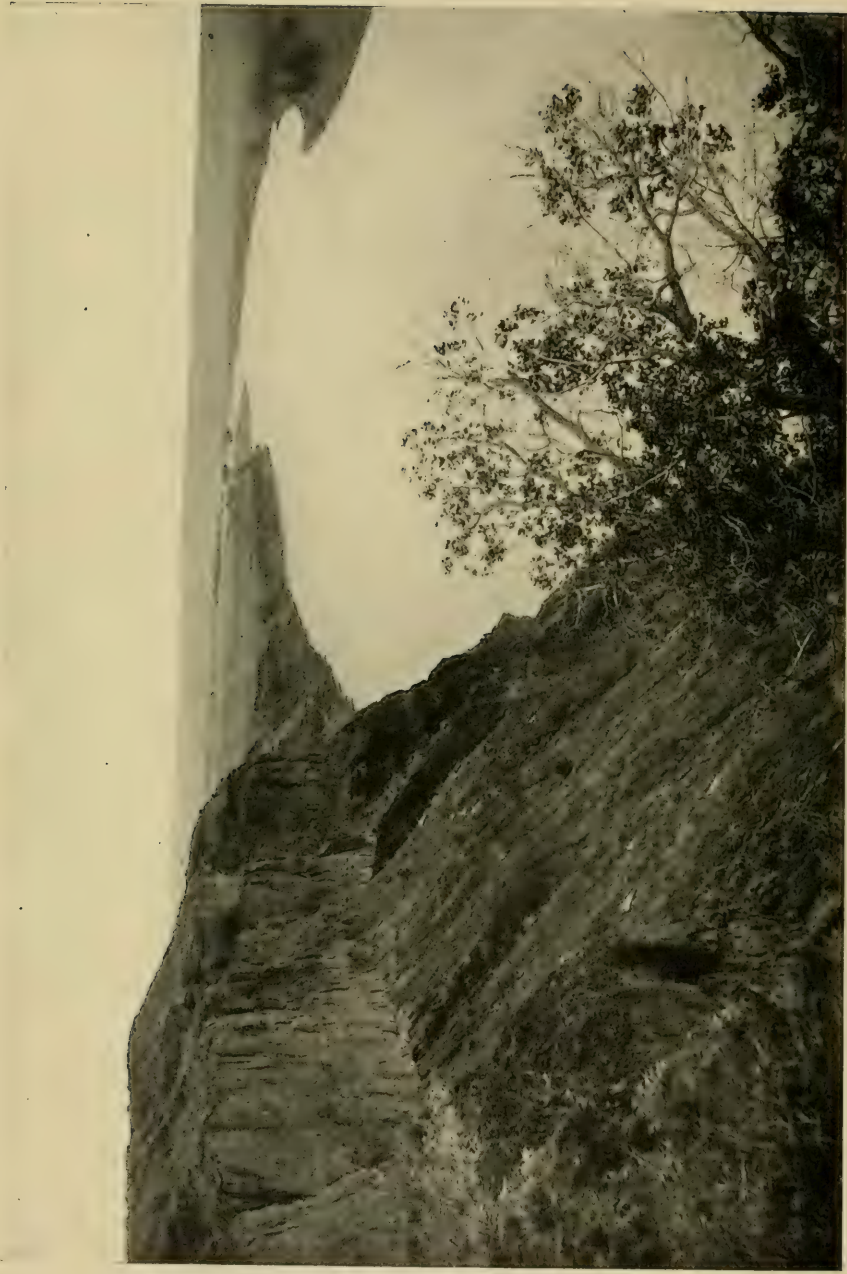
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NESTING SITE OF DUCK HAWK ON YELLOWSTONE RIVER.

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No. 3.

THE BIRDS OF CUSTER AND DAWSON COUNTIES, MONTANA.

BY E. S. CAMERON, F. Z. S. L., M. B. O. U.

Plates V-XII.

INTRODUCTION.

THE present list of birds known to occur in Custer and Dawson Counties, Montana, is the result of observation extending over a period of eighteen years and including almost every part of the area named. A few localities which I was personally unable to visit have been explored by my wife who is a keen observer of birds. I wish to take this opportunity of expressing my indebtedness to Mr. J. H. Price of Knowlton who has been familiar with eastern Montana since the eighties, and was at much trouble to send me information, skins, and notes, besides assisting my investigation in every possible way. Also to Mr. Dan Bowman for many interesting notes of especial value, as he was one of the pioneer settlers of Custer County. As far as I am aware, no list of birds of Dawson County, or any part of it, has hitherto appeared, but the late Captain Platte M. Thorne, U. S. A., published an excellent list, numbering 137 species, of the Birds of Fort Keogh, near Miles City (Custer County), in 'The Auk' for July, 1895, and upon this any subsequent list must necessarily be based.

Regarded geographically the area embraced by the two counties may be divided into river valleys, pine hills, rolling prairie and badlands, but from an ornithological standpoint, as will

presently appear, only two of these divisions deserve recognition, viz.: the pine hills and the prairie. The same physical conformation prevails throughout the country and may be described as a succession of high divides clothed with pines, which slope, more or less gradually, to large rivers.

Most of the intermediate country consists of rolling prairie, intersected by creeks fringed, as are the rivers, with cottonwoods, here and there relieved by a sprinkling of ash, box elder, and willow. In certain districts, however, irreclaimable badlands extend from the top of the divides downwards to the rivers, the most important tract in our area being that known as the Missouri Brakes on the river of the same name, to which I shall again refer. There are no mountains, properly so called, in either county, but Mountain Sheep Bluffs in Dawson County (the greater part of which is still unsurveyed), rise to 4,000 feet above sea level, and Glendive, the capital, has an elevation of 2,091 feet; while Maxwell Butte, on Mispah Creek, in Custer County, is 3,261 feet above sea level, and Miles City, the capital, 2,334 feet. Nor are there any lakes, properly so called, but the abundant rains of certain years form prairie ponds, often several acres in extent, which afford grateful resting-places to passing wild-fowl. Forks Lake, containing about 160 acres, on a fork of the Redwater River (north Dawson County) never becomes entirely dry. The total area of Custer County is 9,368,000 acres, or 14,637 square miles, and that of Dawson County is 13,280 square miles.

Owing to the fact that badlands are generally adjacent to pine hills, and often themselves conceal in their ravines and gulches a thick growth of pines and cedars, the avifauna of the two districts overlaps and is in most respects identical. The same remark applies to the prairie and river-valley regions, for the species frequenting the river bottom ascend the tributary creeks to the plains, and wherever the latter rise into pine hills which enclose wide parks, as in the neighborhood of Knowlton, there will prairie birds, like Curlews and Bartramian Sandpipers, be found nesting.

A few species, such as the Mourning Dove, Nighthawk, Arkansas Kingbird, Horned Lark, Meadowlark, Redpoll, Lark Sparrow, etc., are ubiquitous. Hence it is clear that faunal areas, in the

ordinary sense of the term, even as between prairie and pine-hills, do not admit of precise definition, although the lists made in the two regions plainly indicate a marked diversity in the species inhabiting them.

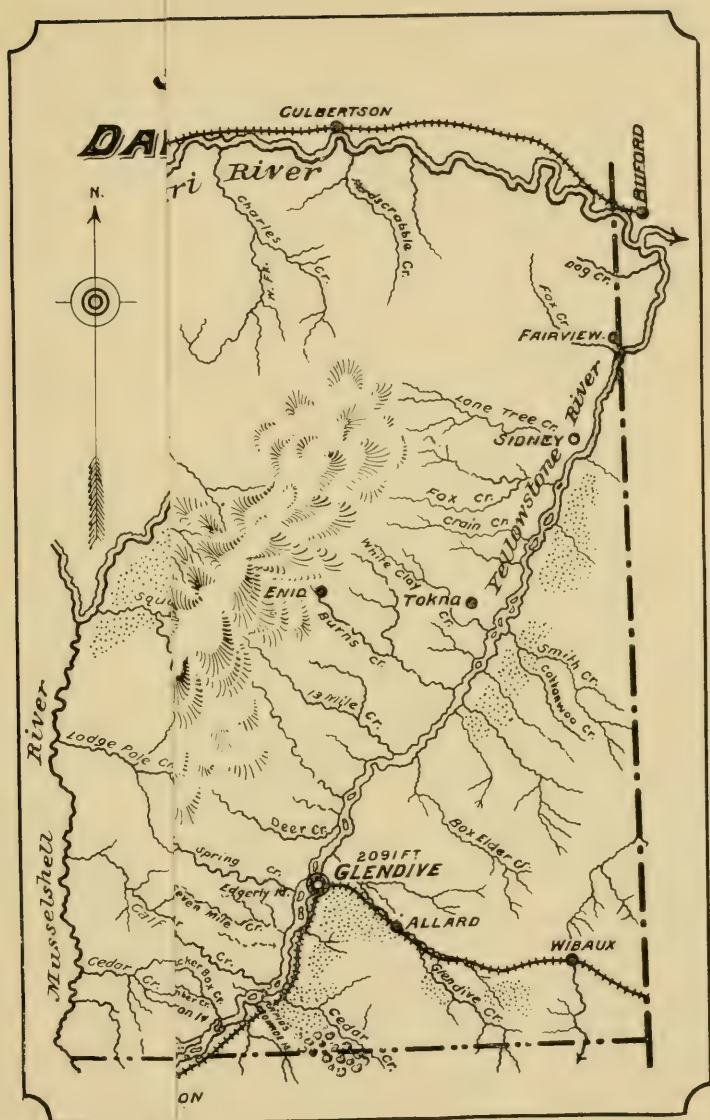
There are few indigenous birds in eastern Montana, and those of necessity are such as can support great extremes of temperature. In my own list of 190 species only 19 are permanent residents. They include the Sharp-tailed Grouse, Sage Grouse, Ferruginous Rough-leg, Golden Eagle, Prairie Falcon, Duck Hawk, Long-eared Owl, Western Horned Owl, Burrowing Owl, Hairy Woodpecker, Batchelder's Woodpecker, Desert Horned Lark, American Magpie, Piñon Jay, American Crossbill, English Sparrow, Northern Shrike, Slender-billed Nuthatch, and Long-tailed Chickadee. The remaining 171 species are either transient spring and fall migrants, summer visitors which nest here, or winter visitors which leave in the spring. Exhausted migrants are met with in most unusual situations. Mr. Lance Irvine, for example, has picked up a Coot on the open prairie, and seen a flock of Great Blue Herons resting in a like situation, while I have flushed a Sora from creeping cedar in the pine-hills. Warbling and Red-eyed Vireos have been caught on my veranda, and Pintail Ducks have alighted just outside of it. Many other instances might be cited.

Both our counties belong to the so called 'plains' region of the west where ranching, or the raising of cattle, sheep, and horses, is the only industry. Rolling prairie is therefore the predominant type of country, sage-brush the characteristic plant, and the Sage Grouse, which everywhere follows the plant, the characteristic bird. This species finds a permanent home in the wilderness of pale green bushes which, albeit they wither to yellow brown in winter, retain their foliage, and thus afford both food and shelter to the bird throughout the year. Icy winds in winter sweep over the khaki-colored expanse, the sage tops thinly veiling the deep snow beneath; and, while under such conditions Sharp-tailed Grouse burrow into the drifts, the more hardy Sage Grouse seems quite comfortable—even in a temperature of 40° below zero (Fahrenheit).

Many flowering plants adorn the prairie in summer, the most conspicuous being the triennial soapweed, whose tall stalks, cov-

ered with cream-colored bell-shaped blossoms, flourish in profusion on gravelly or sandy hills. Among less pretentious flowers are several kinds of lily, yellow daisies, blue hairbells, and quantities of purple vetch. During May, 1892, I travelled on horseback up the Tongue River from its mouth at Miles City to the Big Horn Mountains, a distance of 205 miles, returning by the same route in August, and obtaining thus abundant opportunity to observe the distinctive vegetation and bird-life of the prairie. On the return trip ranch thermometers registered the high temperature of 114° in the shade.

By far the greatest number of birds, both as regards species and individuals, are to be seen along the banks of the large rivers, but ornithological exploration in the badlands derives a peculiar charm from their extraordinary geological features and their intense solitude. Miles may be traversed with never a sign of man nor a sound more civilized than the Falcon's angry scream. The typical breeding birds of the badlands are the Golden Eagle (*Aquila chrysaëtos*), Prairie Falcon (*Falco mexicanus*), Duck Hawk (*Falco peregrinus anatum*), Say's Phoebe (*Sayornis saya*), American Magpie (*Pica pica hudsonica*), Cliff Swallow (*Petrochelidon lunifrons*), and Rock Wren (*Salpinctes obsoletus*). As previously stated, the most important tract of badlands is that known as the Missouri Brakes in Dawson County which borders the Missouri River between the mouths of the Big Dry and Mussellshell, extends to 65 miles long by 10 wide, or thereabouts, and is almost entirely composed of gumbo clay. Notwithstanding its generally arid character, large groves of fir, lodge-pole pine, and red cedar, are to be found under the main divide, which I have twice visited during extended hunting trips in the locality. The first time was during March and April, 1890, when it constituted a regular sportsman's paradise, being full of mule deer, mountain sheep, and grizzly bears. On account of the time of year, however, only the latter were hunted. On April 7 the migration of wild-fowl was at its height, and I have never since seen the Anatidæ so numerous as when camped near the Big Dry River at that date. A second expedition was made early in October, 1895, in company with Mr. J. H. Price, and on this occasion a list was made of the birds observed in the Missouri Brakes at that time. The characteristic



SKETCH MAP OF DAWSON COUNTY, MONT.

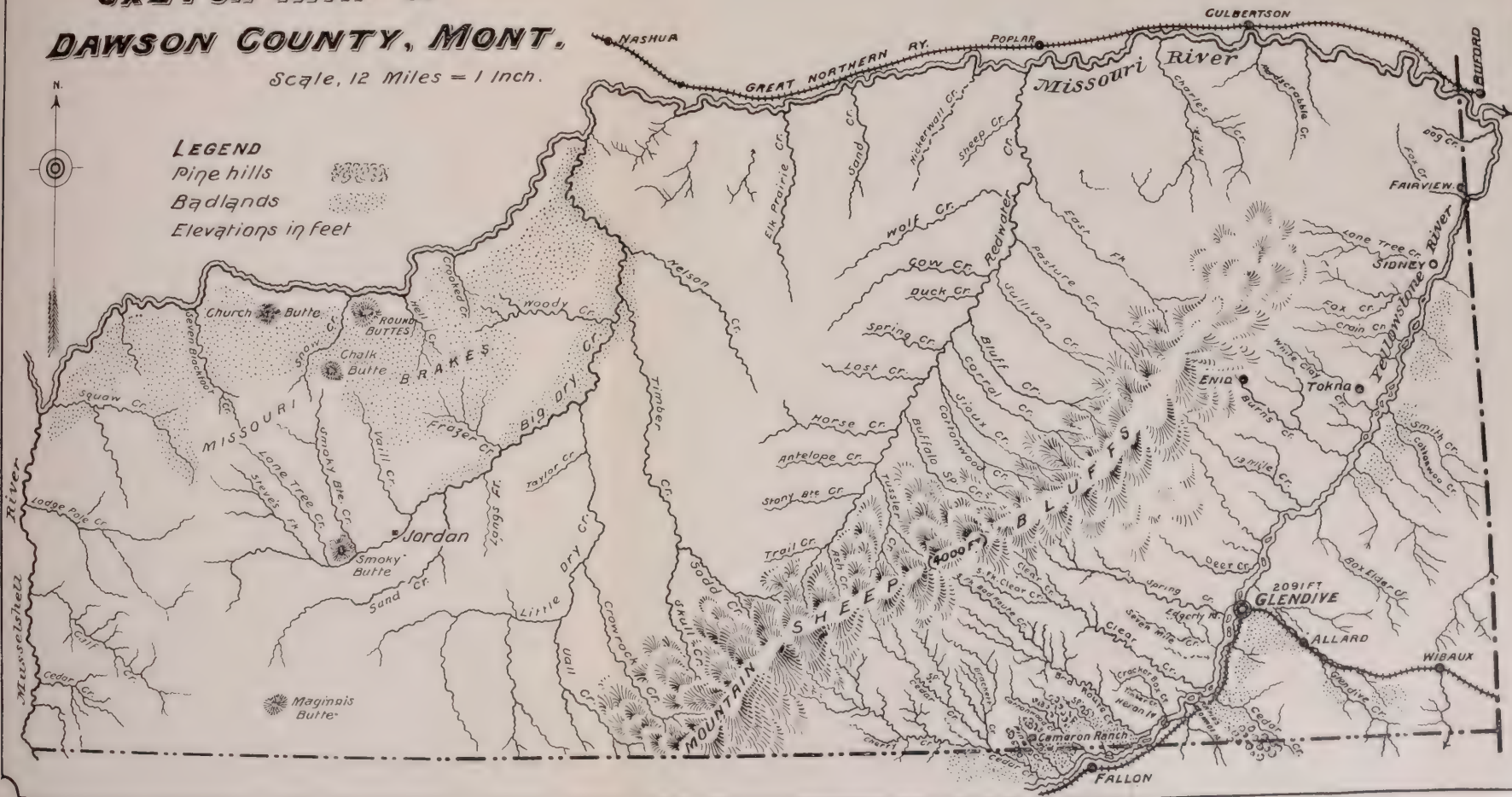
Scale, 12 Miles = 1 Inch.

LEGEND

Pipe hills

Badlands

Elevations in feet



LEGEND

Pine hills



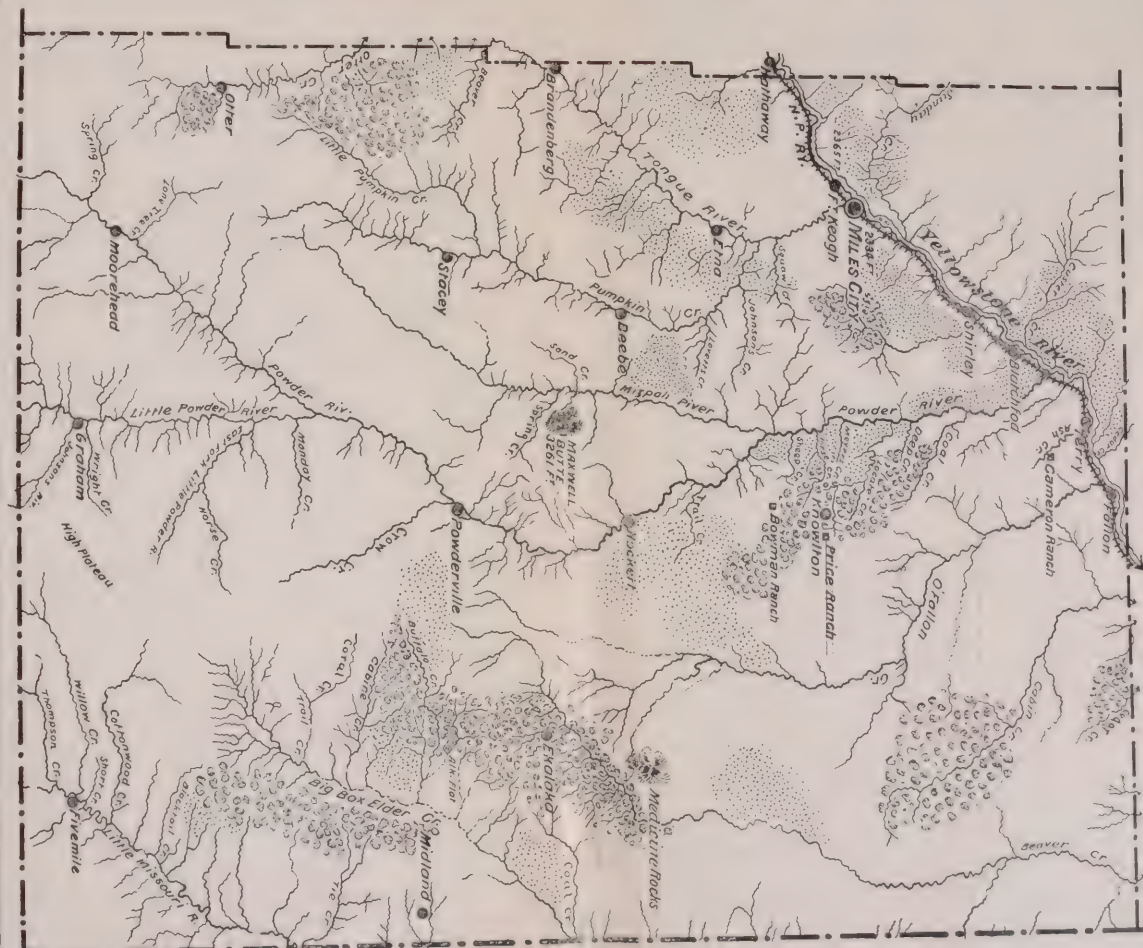
Badlands



Elevations in feet

SKETCH MAP OF CUSTER COUNTY, MONT.

Scale, 12 Miles = 1 Inch.



species were found to be the Slender-billed Nuthatch (*Sitta carolinensis aculeata*), Chickadee (*Parus atricapillus occidentalis*), and Townsend's Solitaire (*Myadestes townsendii*).

Another very wild range of badlands, commencing opposite Terry, extends along the north side of the Yellowstone River to a point about four miles west of the mouth of Custer Creek. I have explored these badlands many times, and have noted among other remarkable features a silicified tree bridging a ravine. Other smaller tracts of badlands occur on the Powder River and elsewhere.

In the badlands of the Yellowstone, despite their reputed aridness, there are surprising bursts of sporadic vegetation. Over the sombre clay walls and terraces the flowery month of June splashes a bright blaze of brilliant colors, as on a painter's palette — here a rich gamboge of yellow daisies, there the deep mauve of hyacinthine blooms, elsewhere the delicate carmine of clustering vetches, and the chaste white of Mariposa lilies. Yellow pines are most numerous and reach their greatest development around Ekalaka and Knowlton (Custer County). A pine covered area thirty miles long, extends from five miles east of Medicine Rocks to a point fifteen miles south of Ekalaka. About five miles south and east of the latter it becomes a regular forest; some of the trees are three feet in diameter, and attain a height of sixty feet before they are branched.

The widest belt of pines and cedars combined is formed by the impenetrable thickets on Cedar Creek (Custer County), which runs into the Yellowstone at Monroe Island Rapids. In places this belt is over two miles across. I built a rough shack and stable within these woods, where, in the early nineties, I was accustomed to go every winter for a few weeks to hunt deer. The thickets were simply alive with Bohemian Waxwings, which subsisted on cedar berries, and gyrated in thousands when disturbed from the high pines beneath which the red stained snow gave evidence of their familiar roosting places. In summer, among the characteristic birds which nest in the pine-hills, are Piñon Jays, Chipping Sparrows, Lazuli Buntings, Chickadees, and Mountain Bluebirds. My ranch in Custer County, five miles south of Terry, was a great haunt of Sharp-tailed Grouse and many other birds,

acres and acres of rose brush clothing the creek bottom while large patches of wild fruit trees were abundant on the hillsides. Under the taller ash and box elders spread a net-work of clematis, which intertwining with plum-trees and choke-cherries, overhung the smaller bushes, the whole forming an impenetrable covert, containing several springs of water while yielding its store of food to the birds. At one place so dense was the thicket, where it joined the north window of the ranch-house, that entry thereto was impossible save by using a fallen tree as a bridge.

Numbers of newly arrived migrants would work through this labyrinth from the north end until their further progress was barred by the window above mentioned. In this way many rare visitors were first observed from inside the room, such as Townsend's Warbler, White-crowned Sparrow, Olive-backed Thrush, etc.

My wife used to thread blue-bottle flies and hang them outside the glass, for the pleasure of watching the Long-tailed Chats and Redstarts, which would suddenly appear and pull them off the string. Many birds nested within these thickets; some of which, to the best of my knowledge, did not do so elsewhere in the county, such as the Black-billed Cuckoo and Cedar Waxwing.

In 1902, I built a ranch in Dawson County amidst pines four and a half miles to the north of Fallon, on the Northern Pacific Railway, and moved over there. The house is situated below some springs surrounded by pines and cedars where I have placed three water-troughs. All species of birds inhabiting the pine hills of eastern Montana visit them to bathe and drink. It is indeed a charming sight in summer to watch the flocks of Crossbills, Piñon Jays, and Goldfinches descend to the water, while in winter such numbers of Rosy Finches come, that the sound of their wings resembles the wind in the pines. Even mule deer from adjacent badlands drink regularly here, passing in early dawn within thirty-five yards of the house. This shows what may be accomplished where the peace of nature is never disturbed.

LIST OF SPECIES.

1. *Colymbus nigricollis californicus*. AMERICAN EARED GREBE.—Not common. A young male was shot by the ferryman at Terry on October 2, 1904, when I kept the skin. Mr. J. H. Price obtained an immature example in summer plumage on Locate Creek and made a skin. I saw two adults floating down the Yellowstone on May 7, 1905.

2. *Podilymbus podiceps*. PIED-BILLED GREBE.—Not common. Sixteen seen May 23, 1904, and eight May 31, 1904. Their manner of diving backwards with head up stream was very noticeable.

3. *Larus argentatus*. AMERICAN HERRING GULL.—Tolerably common, flying up or down the Yellowstone in the fall.

4. *Larus delawarensis*. RING-BILLED GULL.—Tolerably common. Occurs in spring and fall on the Yellowstone. An adult specimen was shot by the ferryman at Terry, May 31, 1906.

5. *Larus philadelphia*. BONAPARTE'S GULL.—Rare. A Bonaparte's Gull in first plumage was shot by Mr. Charles Mackay on August 12, 1904. It was flying over a small lake at his ranch twenty-two miles from Terry. An adult observed by me flying down the Yellowstone on July 31, 1905.

6. *Xema sabinii*. SABINE'S GULL.—Rare. An immature example of this gull was shot on the Yellowstone by the ferryman at Terry, September 23, 1904. He said he had seen about twenty-five others of this species on the previous day.¹

7. *Hydrochelidon nigra surinamensis*. BLACK TERN.—Erratic migrant in both counties. Ten seen June 8, 1895; three August 6, 1898; two July 2, 1905; one May 26, 1906; and two May 30, 1906. Mr. J. H. Price has also observed it in his vicinity (Knowlton). Extraordinarily tame when hovering over prairie ponds.

8. *Phalacrocorax dilophus*. DOUBLE-CRESTED CORMORANT.—Rare. A single bird was seen by my wife sitting behind a rock, at the edge of the Yellowstone, on October 16, 1904. When she was quite close it flapped into the water.

9. *Pelecanus erythrorhynchos*. AMERICAN WHITE PELICAN.—Rare. Mr. Dan Bowman is positive that a pair of pelicans nested on a small wooded island in the Powder River near the mouth of Locate Creek during the summer of 1884. He constantly saw both birds flying there, when camped on the river during the months of June and July, and later one only (as he supposed the male), fishing along the river bank. Unfortunately he did not investigate. Peter Lorenson shot two specimens near Miles City on September 5, 1898. Mr. A. S. Wiley shot a pelican on the Yellowstone in 1903.

10. *Merganser americanus*. AMERICAN MERGANSER.—Rare. On No-

¹ See Auk, Vol. XXII, p. 76, 1905.

vember 12, 1904, a pair of adult males flew low over the ferry boat, at Terry, and alighted on the Yellowstone when I was crossing it.

11. *Merganser serrator*. RED-BREASTED MERGANSER.—Rare. On April 7, 1890, several were seen on a muddy reed-grown lake, in a mixed multitude of other wild-fowl, near the Crow Rock, Dawson County. On February 25, 1902, I saw five mergansers flying which I took to be of this species.

12. *Lophodytes cucullatus*. HOODED MERGANSER.—Rare. A female or immature male of this species frequented a pool on my ranch, near Terry, for several days at the end of June, 1898. When I approached close it showed anxiety by elevating the crest and wings but did not fly away. I observed another on the Yellowstone May 7, 1905. Captain Thorne saw about twenty Hooded Mergansers daily from June 14 to July 17, 1889.

13. *Anas boschas*. MALLARD.—Common on migration. A good many pairs used to breed in Custer County in the early nineties but I have not heard of a nest for many years. Mallards still nest in Dawson County, on Cow Creek, a west fork of the Redwater River.

14. *Chaulelasmus streperus*. GADWALL.—Not uncommon on the Yellowstone. Transient. Numerous on April 7, 1890, near the Big Dry, Dawson County, when I shot two adult males. Mr. J. H. Price has also shot these ducks.

15. *Mareca americana*. BALDPATE.—Not uncommon on the Yellowstone. Transient. I have shot widgeon in both Custer and Dawson Counties. Mr. J. H. Price has also obtained them at Locate Creek, Custer County.

16. *Nettion carolinensis*. GREEN-WINGED TEAL.—Abundant on migration. The bags of wild fowlers made here consist chiefly of this duck and the next. For two days in September, 1892, I observed both species of Teal flying down Tongue River in very large flocks. At that time the Hon. O. H. Wallop, who was with me, killed forty-eight in about two hours' shooting each afternoon as the birds flew past. On Sept. 22, 1906, Mr. H. B. Wiley and Mr. C. F. Hedges (of Miles City) killed 80 teal of both kinds, in about equal numbers, between daylight and 8 A. M. on the Yellowstone. Three years previously Mr. H. B. Wiley and Mr. Al. Jordan shot 61 ducks between daylight and 12 o'clock, noon, on the Yellowstone, which were almost all teal. Mr. J. H. Price has also shot numbers of both kinds on Locate Creek, Custer County. Mr. Dan Bowman has seen the nests and young of this species on Fallon and Beaver Creeks, Custer County, and Mrs. W. S. Haley has seen the young on Taylor Creek, Dawson County. Green-winged Teal breed regularly on Cow Creek in Dawson County.

17. *Querquedula discors*. BLUE-WINGED TEAL.—Common everywhere during migration. While it is certain that these ducks breed on islands of the Yellowstone, as pairs may be seen throughout the summer, I have never actually discovered a nest. On September 27, 1904, a Blue-winged



BADLANDS ON THE YELLOWSTONE RIVER, MONTANA.



PINE HILLS AND BADLANDS ON YELLOWSTONE RIVER AT JUNCTION OF COTTONWOOD CREEK,
DAWSON COUNTY, MONTANA.

Teal was killed by striking against the wire cable of the ferry boat at Terry. On May 18, 1905, in a ride down the Yellowstone from west side of Fallon to Conlin (7 miles) four hundred and fifty ducks were examined and counted through binoculars. Of these twelve were Gadwall, six Widgeon, six Mallard, the remaining four hundred and twenty-six being composed of Shovellers and Blue-winged Teal.

18. ***Spatula clypeata***. SHOVELLER.—Common, arriving about end of March or beginning of April, associating with other ducks, chiefly Pintail, Green-winged and Blue-winged Teal. Many remain all the summer and frequent the unsheltered prairie ponds. I have seen them as late as the middle of July in these exposed situations, when they are tame and unsuspicious, but I have not found a nest. When a party of Shovellers are feeding on a prairie lake the adult drakes have a curious habit of constantly raising themselves in the water by balancing on their tails.

19. ***Dafila acuta***. PINTAIL.—Common but transient. According to my records, kept since 1889, one of the commonest ducks on the spring migration. Pintail never remain long, even when unmolested, and on this account are seldom shot. While reported from most parts of both counties they prefer alighting near the large streams, and Mr. J. H. Price has never seen them in his locality (Knowlton). Terry flat is a favorite resting place. On my return trip from the Missouri Brakes, in April, 1890, when hosts of wild-fowl were seen, the Pintail outnumbered the others and were numerous on the Powder River where I lived.

I have several times seen a flock of these graceful ducks arrive at close quarters. Although much larger than Green-winged Teal, their light and graceful evolution resemble the latter, when, attracted by water, they swoop down to it as if to settle, but again shoot upwards. If satisfied that there is no danger they straggle into the pool, uttering a very soft low quacking, and immediately on arrival begin washing, playing, feeding, and walking about.

Mr. J. Alex. Fraser (of Glendive) informs me that he saw about a thousand migratory Pintails, in different bunches, on one day of September, 1906, at Al. Stillson's ranch on Cow Creek, Dawson County, where some of these ducks breed and are protected by the proprietor.

20. ***Aythya americana***. REDHEAD.—Not common. Occasionally observed on Yellowstone; thirty seen September 26, 1903. Mr. J. H. Price has twice seen Redheads on the smaller creeks. Mr. Dan Bowman has seen them "once or twice."

21. ***Aythya affinis***. LESSER SCAUP DUCK.—Tolerably common. Scaup are fond of frequenting the reservoirs of J. B. Kempton, near Terry, four miles from Yellowstone. Twenty-three seen on Yellowstone May 7, 1905.

22. ***Clangula clangula americana***. AMERICAN GOLDEN-EYE.—Not common. Occasionally seen on Yellowstone. Twelve haunted the vicinity of the Fallon ferry for some weeks during October, 1903. Thirty observed flying up Yellowstone September 26, 1904, and ten seen flying down October 19, 1906.

23. *Charitonetta albeola*. BUFFLE-HEAD.—Captain Thorne records this duck as rare. I have not noticed it. Mr. H. B. Wiley (of Miles City), who has had considerable experience of duck shooting on the Yellowstone informs me (*in lit.*) that he has never seen it.

24. *Somateria dresseri*. AMERICAN EIDER.—Mr. Charles Freer of Glendive assured me that an Eider Duck was shot there in 189? and identified by a Norwegian.

25. *Erismatura rubida*. RUDDY DUCK.—Captain Thorne mentions a flock of about forty observed April 21, 1889. I have not seen it but Mr. H. B. Wiley has shot a few of this species on the Yellowstone.

26. *Chen hyperborea*. LESSER SNOW GOOSE.—Rare. Transient. April 7, 1890, on Big Dry River, Dawson County, several seen. In spring of 1892 on Powder River, three seen. One of these was wounded by Mr. E. Coggsall with a rifle and lingered on the river but was not secured. November 12, 1903, eight seen flying south. September 12, 1904, eight flew within gunshot of the ferryman's house at Terry.

27. *Chen rossii*. ROSS'S SNOW GOOSE.—Captain Thorne killed a goose of this species on April 25, 1892.

28. *Branta canadensis*. CANADA GOOSE.—Common on migration. Very few geese breed here now, compared to the numbers that did so formerly, in the tops of broken tree-trunks, in hollows of partly decayed trees on ledges of precipitous cliffs, and the islands of rivers. In 1892, about one hundred goslings were hatched on the Lower Powder River alone. Here, in 1890, I was shown two goose nests in the high branches of cottonwoods, and, during June, 1893, a goose sat in a like situation at Jack Selby's lambing camp on Powder River.

Although in my experience and that of Mr. Dan Bowman, geese generally repaired the deserted nests of Swainson's Hawk, I know of two authentic instances when they were observed to build the entire nest for themselves amidst the branches.

When nesting in trees the goose carries her young on her back, like the Eider Duck from the rocks in the Orkney Isles.¹ In the late nineties a goose nested every year in a hollow cottonwood by the Yellowstone on what is now my land. The nest was about six feet from the ground and composed almost entirely of down and feathers from the goose's own body.

Mrs. A. Smith of Fallon hatched eight eggs from this nest under a hen and kept the goslings for two years. She informed me that if two clutches of eggs were removed the goose would, nevertheless, lay a third set. For four years (1903-06) a pair of geese reared a brood near this place and the young were seen by me and other observers. Although the nest was undoubtedly on the ledge of a vertical cut bank above the Yellowstone it was not discovered until June 1, 1906. At this time the goose, after laying eight eggs, had deserted it, on account of a landslide which had

¹ See 'A Fauna of the Orkney Islands' by Harvie-Brown and Buckley, who published my notes on this subject.

partially covered up the nest. The average date for the spring arrival of the Canada Goose at Terry is March 27.

29. *Branta canadensis hutchinsii*. HUTCHINS'S GOOSE.—Rare. On October 4, 1903, twenty of these small geese flew low over me as I waited on the north bank of the Yellowstone for my wife who was being conveyed across by the ferryman. All obtained a good view.

30. *Olor buccinator*. TRUMPETER SWAN.—Rare. About May 1, 1884, Mr. Dan Bowman saw ten or twelve swans resting on the Powder River just after sunrise. On October 27, 1905, an adult male Trumpeter Swan was shot by a boy on the Yellowstone at Tusler, near Miles City.

31. *Botaurus lentiginosus*. AMERICAN BITTERN.—Not common. Occurs regularly on migration.

32. *Ardea herodias*. GREAT BLUE HERON.—Common in both counties.¹ (Plate VIII, Fig. 1.)

33. *Grus canadensis*. LITTLE BROWN CRANE.—An irregular fall migrant occurring in flocks of from ten to one hundred and fifty. This is the common Sandhill Crane of this region, *Grus mexicana* being much rarer. On September 24, 1894, a large flock hovered for some time above my ranch house in Custer County, with the intention of alighting, when I could not afford time to watch them. In September, 1898, a regular invasion of southward bound flocks took place at Terry. The inhabitants pursued them with every description of weapon but only one was shot — by J. C. Braley, with a rifle at three hundred yards. When fired at with a rifle the birds would fly only about half a mile and again alight, so that the fusillade could be continued at intervals. The only possible way of obtaining specimens is from concealment in the corn fields which they frequent. The cranes always flew low, generally within shot from the ground of a heavy shoulder gun, and in a straggling manner, although during migration they rise to a great height. They continued to arrive in the neighborhood of Terry for three weeks (until October 10) when all had left excepting a small flock. If undisturbed the cranes fed in the morning and evening, strongly recalling turkeys in general behavior; their stately manner of walking and drooping tertiary plumes causing them to present a striking appearance.

34. *Grus mexicana*. SANDHILL CRANE.—Rare. May, 1892, one caught with a fish hook, baited with a frog, by Oliver Van on Fallon Creek, as he informed me. At that time Sandhill Cranes were reported numerous in that locality. September 22, 1893, flocks were seen on Powder River, which ran dry and the birds were attracted by the stranded fish. Mr. Dan Bowman, who was familiar with these birds in Missouri and Nebraska, has only seen them twice in Montana.

35. *Rallus virginianus*. VIRGINIA RAIL.—Captain Thorne records a male killed August 10, 1888.

¹ See Cameron, Nesting of Great Blue Heron in Montana. Auk, Vol. XXIII, 252.

36. **Porzana carolina.** SORA.—Tolerably common. One killed against telegraph wire (Terry), September 12, 1901. Another impaled on barbed wire fence (Terry), September 7, 1903. My grayhounds have flushed it from sage-brush, and I have seen it so tame on the spring migration that at first it might have been caught by the hand. There is a small colony nesting in a marsh about two miles east of Terry. I rode there on June 18, 1898, and found the nests which were almost in the water of a grass grown pool, difficult to approach. Two contained thirteen and five eggs respectively. Their owners when disturbed creep about in the adjoining long grass and rose brush.

37. **Fulica americana.** AMERICAN COOT.—Tolerably common. Breeds. In October, 1904, a coot in an exhausted condition was picked up on the prairie by Mr. Lance Irvine, which he conveyed to the ranch kitchen where it soon recovered and was liberated.

38. **Phalaropus lobatus.** NORTHERN PHALAROPE.—Occasional migrant, usually in small numbers. On May 21, 1899, an extraordinary invasion of phalaropes occurred at my ranch in Custer County, six miles south of Terry, when examples of both these species and the next continued to arrive in greater or less numbers until the end of the month. At first the Red-necks predominated, and Mr. H. Tusler, whose ranch adjoins mine on the south, and who was the first to observe their advent, brought me three specimens of *Phalaropus lobatus* on the date above mentioned, shot, as he informed me, out of at least three hundred birds, which included (as I subsequently learned) a few of *Steganopus tricolor*. All the birds were swimming about in shallow lakes, formed by the recent rains, on the prairie. The relative numbers of the two species were subsequently reversed, for, the main flight of Red-necks having passed, only a few were afterwards seen sprinkled among the Wilson's Phalaropes, which continued to arrive daily in considerable flocks. Both species frequented the temporary ponds formed by the abundant rains in the depressions of grass-lands, but seemed to shun the regular creeks and water-holes altogether. At the moment of alighting they were so thickly disposed that a large number might have been killed by one shot, but immediately after reaching the surface of the water they scattered in all directions over the pond. The Wilson's Phalaropes, both when feeding and when disturbed and circling on the wing, constantly uttered a low croaking, which at close quarters might be compared to the much louder note of the Sandhill Cranes, or, at a distance, to the faintly heard barking of a dog. On the other hand, I have heard them give a shrill and totally different call of indecision or satisfaction on their first arrival, when hovering above a pool. Both species gave the impression of extraordinary activity as they fed greedily on a species of gnat which swarmed close to the surface of the water. To catch these gnats they swam about with incredible swiftness moving their necks from side to side, or backwards and forward, incessantly. In every flock of Wilson's Phalaropes the females greatly outnumbered the males.

The stomachs of the phalaropes examined contained minute stones, grass, and the black gnats above alluded to, mashed to a pulp. The eggs in the ovaries of the females were extremely small, not much larger than pin-heads; in only one was there an egg the size of a pea: ' (Condensed from 'The Ibis' for January, 1900, page 67.)

39. *Steganopus tricolor*. WILSON'S PHALAROPE.—Occasional migrant. See above.

40. *Recurvirostra americana*. AMERICAN AVOCET.—Uncommon spring migrant. In the spring of 189? two specimens were obtained on Powder River at the ranch of Mr. William Ferdon and are now in his possession.

On or about May 1, 1904, eleven avocets alighted in the mud of the north shore of the Yellowstone between Terry and Fallon. Mrs. W. S. Haley, wife of a ranchman living on the river bank, shot an adult female which she gave me.

On May 7, 1905, I watched, through binoculars, a flock of twenty-two avocets on the Yellowstone near Terry for a considerable time. The avocets appeared anxious to leave but were afraid to do so as a pair of Peregrines wheeled overhead. The former flew in low circles over the river, and, uttering shrill cries, alighted in deep water swimming until they could wade. Many were in immature plumage while others had a complete cinnamon neck and head. On May 16, 1906, I saw an avocet in splendid plumage at Mr. W. S. Haley's dam.

41. *Gallinago delicata*. WILSON'S SNIPE.—Tolerably common. Mr. J. H. Price informs me that it breeds, and he has seen the downy nestlings at his ranch on Locate Creek. A few birds remain during the winter.

42. *Actodromas maculata*. PECTORAL SANDPIPER.—Rare. Mr. J. H. Price gave me one of a pair of Pectoral Sandpipers which he shot while duck-shooting in a snow-storm on October 18, 1905. Although an ardent wild-fowler, whose Montana experience dates back to the eighties, Mr. Price had never before met with this species but identified it by means of Chapman's 'Color Key.' Three days later, on October 21, I saw a Pectoral Sandpiper at the edge of J. B. Kempton's reservoir near Terry.

43. *Actodromas bairdii*. BAIRD'S SANDPIPER.—Captain Thorne mentions this bird as rare. I have not seen it.

44. *Actodromas minutilla*. LEAST SANDPIPER.—Irregular migrant. Numerous at the time of the invasion of Phalaropes, beginning May 21, 1899, and consorting with them.

45. *Ereunetes pusillus*. SEMIPALMATED SANDPIPER.—Captain Thorne records this sandpiper as "Common in spring." I have not come across it.

46. *Limosa hæmastica*. HUDSONIAN GODWIT.—Rare. A female Hudsonian Godwit in transition plumage was shot by George Tusler at his brother's ranch near Terry, on May 10, 1899, and brought to me for identification. This was in the spring of the memorable flight of waders described in 'The Ibis' for January, 1900. The skin was sent to Professor

M. J. Elrod of the University of Montana. I saw a godwit on April 7, 1890, near the Crow Rock, Dawson County, but could not ascertain the species.

47. *Totanus melanoleucus*. GREATER YELLOW-LEGS.—Not common like the next. I saw numbers on Tongue River in the fall of 1892. One shot on Powder River in the fall of 1889.

48. *Totanus flavipes*. YELLOW-LEGS.—Common in fall.

49. *Helodromas solitarius*. SOLITARY SANDPIPER.—Common in fall.

50. *Symphemia semipalmata inornata*. WESTERN WILLET.—Irregular migrant. May 25, 1902, a flock of eleven willets alighted near the Terry ferry boat and George Tusler (deputy sheriff) killed an adult male with his revolver. The remaining ten uttered loud shrill cries but did not go far away. May 27, 1903, six willets were seen at the edge of the Yellowstone. September 5, 1903, when my wife and I were in a buggy, seven willets flew up the road towards us and alighted at a waterhole half a mile from Terry. September 8, 1903, we saw nine willets standing in the Yellowstone. Mr. J. H. Price has never met with this bird and Captain Thorne reports it as "rather rare in spring. About twelve seen in all."

51. *Bartramia longicauda*. BARTRAMIAN SANDPIPER.—Common, arriving the middle of May. These sandpipers are nowhere so abundant in Custer County as on the big prairie flat, some twenty-five miles across, which extends from about four miles south of Terry to the pine hills. Numbers breed here, and two or three pairs bred annually upon my ranch in Custer County or that of Mr. H. Tusler adjoining, which mark the northern boundary of this plain. The birds made no nest but laid four eggs in the center of a tussock of grass, which are invisible from outside, and above the level of the ground upon the pressed down herbage. In one instance the sitting bird was so tame that she remained only two feet from her eggs when flushed and would peck at an extended forefinger. Nestlings are seen early in July.

The Bartramian Sandpiper appears less numerous in Dawson County.

52. *Actitis macularia*. SPOTTED SANDPIPER.—Common. Breeds along the Yellowstone, as I have seen the young birds but never happened actually to discover a nest. On May 18, 1905, counted twenty Spotted Sandpipers along the Yellowstone shore.

53. *Numenius longirostris*. LONG-BILLED CURLEW.—A very common summer visitor, arriving about the middle of April. Curlews nest all over the prairie and in the fenced pastures of ranches, the young being all hatched out before the middle of June. Eggs have been found as early as the first week in May. Curlews lay four eggs on the dry open uplands, in a hollow of the plain lined with dried grass; they are difficult to find unless a flock of sheep or bunch of horses are driven over the ground which force the sitting birds from their nests. The incubating curlews will allow horses to all but tread upon them, and they look so like "buffalo chips" as to be easily mistaken for them at a little distance. If the female

runs along the ground with humped back and slightly elevated wings she has eggs close by; if, on the other hand, she flies towards and around the intruder screaming vociferously, the young are hatched out and concealed in the vicinity. On their first arrival and during the nesting season, when they are usually met with in pairs, curlews are exceedingly fearless but as soon as the young can fly (at the end of July), they collect into large flocks, prior to migrating, which may contain a hundred birds in each. They are then shy and difficult of approach but as far as I am aware nobody ever tries to shoot them here. (Plate VIII, Fig. 2.)

Curlews feed chiefly on grasshoppers, but there is an abundance of beetles and grubs for them before the first named mature, about the middle of June. I have seen the nesting curlews make flying attacks at Swainson's Hawk and the Marsh Hawk with their long bills, just as they drive away Richardson's Skua in the Orkney Islands.¹

54. *Charadrius dominicus*. AMERICAN GOLDEN PLOVER.—Occasional fall migrant. On September 9, 1896, I saw a flock of thirty or more Golden Plover on a bare flat near my ranch in Custer County. I remained motionless and they wheeled around my horse within easy shot. On the 16th of the same month, at the same place, I observed a small flock of fifteen birds which crouched to the ground as I rode up to them. They seemed very tame and only flew a few yards. On September 23, I again saw eight birds in the same locality. Their call is similar to that of the European form.

55. *Oxyechus vociferus*. KILLDEER.—Abundant. One of the earliest summer visitors, arriving at the end of March. Killdeer are very tame and confiding and will rear young close to ranch buildings, although a stony slope near water is a favorite nesting site.

56. *Podasocys montana*. MOUNTAIN PLOVER.—A regular summer visitor, but scarce. Two or three pairs breed annually on the prairie dog towns in the vicinity of Terry. Their eggs are very hard to find, but I have seen an egg as early as May 23. The birds spend most of their time on the ground, where they run with incredible swiftness, fully twice as fast as a Killdeer, which alone would always attract attention to them. If forced to rise these plover fly very low, and run for some distance upon alighting, when they will allow themselves to be pressed closely before taking wing again. When disturbed they have a curious habit of collapsing, or shrinking into themselves, and stretching their bodies to the full height alternately. On June 15, 1898, I was out with three grayhounds looking for a coyote when I saw a pair of these plovers in the center of a prairie dog town. I at once began to look systematically for a nest, walking in circles, starting from my horse, which stood wherever he was left, the three dogs lying beside him. Having searched in this manner for nearly three hours without result, or even seeing either plover again, I was beginning to lose heart when a single plover again appeared showing

¹ See Harvie-Brown and Buckley, *A Fauna of the Orkney Islands*, p. 225.

extreme agitation at my approach. Running with a trailing wing she would fall over and lie struggling on the ground, which induced the dogs to chase her away, and convinced me that she had young close by. I again made the dogs lie down by the horse and began to search in small, gradually increasing circles, but not without opposition on the part of the distracted parent which sought by feints and struggles to engage my attention. All the time she kept up a short, shrill whistle, dropping at intervals to a harsh note, and appearing to utter these sounds without opening her beak.

Finding her efforts unavailing she would run close up to me, and flinging herself down, remain motionless with outspread wings, in the hope that I would desist from my search to pick her up. By her manoeuvres she assisted me to find her nestlings and I soon saw two little pale yellow birds, spotted with black, together with an egg, on the bare ground, for there was no pretence at a nest. The two nestlings were perfectly helpless and unable to stand, which seems to indicate that some days must elapse before the young of this species can run.

57. *Pediceetes phasianellus campestris*. PRAIRIE SHARP-TAILED GROUSE.—Common. (Plate IX, Fig. 2.)

In the pairing season the Sharp-tailed Grouse indulge in an extraordinary 'play' which is called a 'chicken dance' and roughly may be said to take place every day, excepting during stormy or threatening weather, from about April 10 to May 10. In the spring of 1900 I had unusual opportunities for watching it, the grouse having chosen for their playground the further bank of the creek intersecting my ranch, which here sloped from a high steep cliff on the south to a level sage brush flat on the north. As the channel of the creek was deep it was possible by using great care to approach close to them without being observed, and on two occasions I got within twenty yards, being at one time only about six yards from some of the birds. Not until April 18 did I actually observe the grouse, although their dance was begun at least a week earlier, as could be told by their cooing, which was audible about a mile on a still day. There was an open space in the sage brush which was thick on the down creek or north side, and to this point they flew by twos and threes until twenty had assembled on the playground, not to mention the hidden spectators. The average time for the beginning of the dance was about 4.30 P. M., which continued until six or much later if there were many interruptions. What little I had previously seen and read had led me to suppose that the play of this grouse would be an excitable, confused performance very different from the regular evolutions actually witnessed, and which I have endeavored to set down here as accurately as possible. At this date (April 18) the ball is opened by a single cock making a run across the open space as fast as he can use his legs, the tail being inclined stiffly over the back, while the wings are dragged, so that a large white area is exposed behind. The vivid yellow supraciliary fringe is erected, and, all



FIG. 1. GREAT BLUE HERON.
Nine weeks old.



FIG. 2. NEST OF LONG-BILLED CURLEW.



FIG. 1. SHARP-TAILED GROUSE.

One of two that entered a 'wired-in' 'garden patch' and believed themselves to be unable to escape.

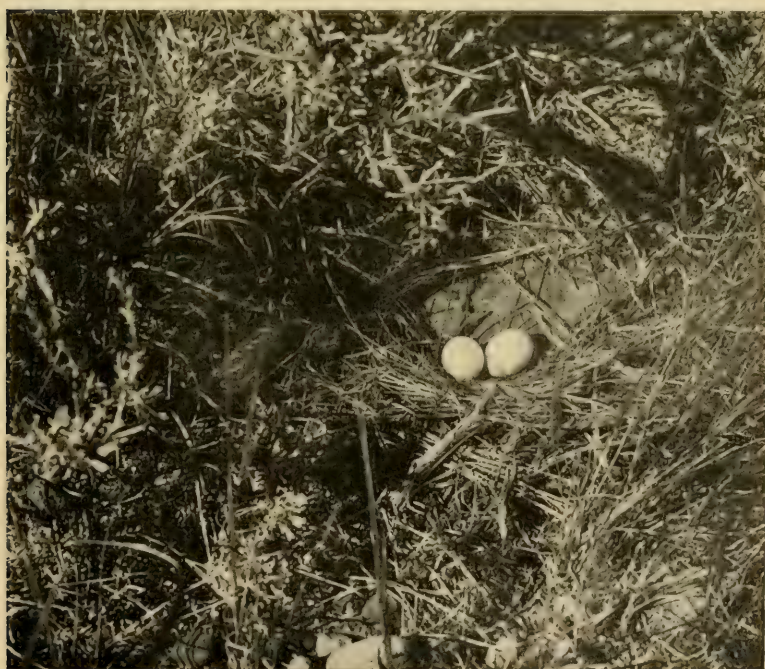


FIG. 2. NEST OF MOURNING DOVE IN SAGE BRUSH ON PRAIRIE.

the feathers of the neck standing on end, a pink inflated sac is disclosed. At the same time the head is carried so low as almost to touch the ground, so that the bird is transformed in appearance and, as observed through binoculars at some distance, looks to be running backwards. He then returns at full speed when another cock comes forward towards him, both advancing slowly, with vibrating tails, to meet finally and stand drumming their quills in a trance with tightly closed eyes. After perhaps a minute one bird peeps at the other, and seeing him still enraptured, resumes an upright graceful carriage, anon stealing gently away. His companion is thus left foolishly posing at nothing, but presently he too awakes, and departs from the arena in a normal manner. Meanwhile the remaining cocks, one after another, take up the running till all have participated, but the end of each figure seems to be the same. Two birds squat flat on the ground with their beaks almost touching for about twenty minutes, and when they do this they are out of the dances for that day. As the grouse make their runs at intervals the play is spread over an hour and a half, but when this was at its height the small open space, about thirty yards in diameter, presented an indescribable scene. While three or four of the metamorphosed cocks might be 'running,' the pairs already formed would squat flat with outspread wings, and other cocks, facing each other, would drum in ecstasy, oblivious to their surroundings. At the same time an ardent suitor would now and again chase a hen across the playground until she leaped high in the air, upon which the pursuer would seem to forget her and make a 'run.' After watching for about an hour the hens too made little runs but displayed no air sacs. All this time the spectators of the dance, concealed by sage brush, kept up an incessant *coo, coo, coo*, as if to applaud. The proceedings were quite amicable throughout. I did not see the slightest inclination to fight on the part of the performers: on the contrary, if two cocks collided, as sometimes happened, they would squat in apologetic fashion. After upwards of an hour of running, posing and flopping, the dancers became exhausted, and were constrained to pant painfully, a result not to be wondered at, seeing that during the play period 90° in the shade was registered. The dance appears to terminate by some bird, either a late starter or one more vigorous than the rest, being unable to find a partner to respond to his run. Having assured himself of this, he utters a disgusted clucking, and all the grouse fly away at intervals as they complete their term of squatting.

On April 29 and 30 I again watched the play which was still being energetically carried on although the runs were, of course, fewer, the drumming with the tail louder, and the crouching process more prominent and prolonged; whereas earlier in the month only two or three pairs squatted, now seven couples nestled together as close as possible, and whenever a disengaged bird approached, one of the pair rose to drive it away with the regular chicken dance run. I concluded that these affectionate pairs were birds mated for nesting although no act of pairing was witnessed by

me. On the 30th, the grouse were put to flight three times, once accidentally by me and twice by a Marsh Hawk, but all flew back again to the same spot within a few minutes. When suspicious, warning clucks from the onlookers stopped the play, and the grouse drew themselves to their full height, resuming their natural trim appearance. Under these circumstances there is no difference between the sexes, the pink sac characterising the males being invisible, which increases the difficulty of distinguishing them and making accurate observation. After days of watching it was evident that the birds, though running at each other like game cocks, never fought, while several males (presumably young) remained passive spectators. The hens to some extent participated in the dance. Subsequent to the above observations I watched the grouse closely to discover if they really paired, and concluded that they do so in an irregular manner. The cocks forsake the hens as soon as incubation commences, and, lending no assistance in rearing the young, may be met with in small parties of about half a dozen.

58. *Centrocercus urophasianus*. SAGE GROUSE.—Abundant on the sage plains of both counties. Formerly nested upon my ranch in Custer County, and in 1902 I tried to rear some by setting two clutches of eggs under hens. Out of fourteen birds hatched, only two reached maturity. To the best of my knowledge Sage Grouse have never been reared in captivity before. The strip of country in Dawson County enclosed by the Musselshell, Yellowstone, and Missouri Rivers, and extending westward from the junction of the two latter, is a chief haunt of Sage Grouse, several localities, such as 'Sage Hen Springs' and 'Sage Hen Creek,' being thus named on account of the abundance of these birds. During the first half of April the males repair to a regular 'playground,' but it is a difficult matter to observe their love antics on account of the encompassing sage. However, on April 7, 1896, my wife and I happened to ride close upon a number of old cocks, near our ranch, which were engaged with their play in a small open space. They never fought nor threatened each other but strutted or paraded before some hens concealed in the sage bushes, and were entirely occupied with a most grotesque rivalry. By ruffling up all their feathers, spreading their tails, and dragging their wings along the ground they looked much larger than they really were, while they produced a rattling sound with their quills after the manner of turkey-cocks and peafowl. At the same time they continuously uttered a kind of whistling challenge, and distending their necks by means of their air sacks erected an enormous white ruff. As the playground was small the eight or nine cocks upon it were in imminent danger of a collision, but for the ten minutes that we watched them, this did not take place, nor were there any moments of ecstatic oblivion for which some game birds are famous. As will be seen from the above their courtship is rather a display than a 'play,' thus differing from the performance of the Sharp-tailed Grouse, which is described under that bird.

59. *Zenaidura macroura*. MOURNING DOVE.—Abundant, arriving about May 1 and usually leaving first week in October. Nests indifferently on the ground or on trees. (Plate IX, Fig. 2.) A Mourning Dove hard pressed by a hawk took refuge in Mr. Dan Bowman's buggy as he was driving along.

60. *Cathartes aura*. TURKEY VULTURE.—Rare. Mr. Dan Bowman informs me that during the fall of 1883 Turkey Buzzards were incredibly numerous in eastern Montana, and roosted in thousands on the Powder River in the vicinity of his ranch. The birds constructed their nests in the cottonwood trees along the river, the stench from these rookeries being so great that it was almost impossible to approach. He tells me that the young were fed by regurgitation. Without doubt it was the prodigious slaughter of bison (*Bison bison*) which attracted the birds, for while the southern herd (estimated at four millions) had already ceased to exist, the northern herd (containing about a million and a half) was wiped out in 1883.¹ From this time on, the Turkey Buzzards have become more and more scarce until in the present year (1906) they must be regarded as accidental wanderers. Mr. D. Bowman fixes the fall of 1887 as the date when they ceased to nest here—a colony of about 75 birds then occupying the pines of the East Powder River divide—but Mr. J. H. Price, who lives in this district, has observed young birds since.

I take the following records of Turkey Buzzards from my diaries:—

August, 1892, 4 seen gyrating above Tongue River, Montana.

April 10, 1893, 5 on my ranch in Custer County.

July 29, 1894, 6 near Fallon at a dead calf; two so gorged as to be unable to fly.

October, 1896, 1 shot by Mr. Walter Lindsay at carcass of horse on Mizpah Creek.

June 12, 1898, 1 remained on my ranch in Custer County for three days.

April 18, 1906, 2. A Turkey Vulture arrived on my ranch in Dawson County and was afterwards joined by a second, when the pair must have nested in the adjoining bad land as they remained there during the summer.

61. *Circus hudsonius*. MARSH HAWK.—The commonest hawk here with exception of the Desert Sparrow Hawk. Males arrive about the end of March and females somewhat later, all leaving again in the middle of October. For many years a pair nested below my ranch house in Custer County, and always received strict protection. This bird is the common 'Henhawk' of eastern Montana and is the most pertinacious of any in attacks on the poultry yard. Young Marsh Hawks weighing about ten ounces will endeavor to disable a chicken weighing a pound, by pecking it on the head and striking on the back at the same time with the feet, their strong wings enabling them to keep directly above it no matter where the prey may run. Birds of the year, through inexperience, are the most

¹ See 'The Extirpation of the American Bison,' Hornaday, 1889.

daring, and my wife has taken a screaming pullet from the claws of one of them which found the prize too heavy to lift.

62. *Accipiter velox*. SHARP-SHINNED HAWK.—Tolerably common summer visitor and undoubtedly breeds, although I have not found its nest. For its size it is astonishingly bold. During September, 1904, a Sharp-shinned Hawk frequented my ranch in Dawson County and kept all the birds away which were accustomed to come to the cattle troughs. It would dash at the flocks of Crossbills and the other birds with tremendous velocity, scattering them in all directions. We have even seen the little hawk strike at some fowls close to the house, which weighed four pounds, sending them screeching and flying for shelter. It would stoop at Flickers, following them into trees, and strike the trunk of a pine simultaneously with and beside the screaming fugitive without making any attempt to seize it. I therefore came to the conclusion that these and previous attacks on the poultry were made purely for sport.

63. *Accipiter cooperi*. COOPER'S HAWK.—Rare. In sixteen years I have only seen this hawk three times. At my ranch in Custer County, one, on September 13, 1893. At my ranch in Dawson County, one, which flew out of a belt of pines on April 30, 1903. At the last named place on August 7, 1905, the loud screaming of a flock of Piñon Jays attracted my attention to a Cooper's Hawk by which they were menaced.

64. *Accipiter atricapillus*. AMERICAN GOSHAWK.—An irregular fall migrant in both counties. According to my records it is of more common occurrence than Cooper's Hawk. I never saw a Goshawk myself until September 22, 1903, but Mr. J. H. Price (who used to go hawking with one in England), has seen the bird several times during the last seventeen years when shooting ducks in the fall. On October 18, 1905, Mr. Price was after ducks in a snowstorm at his ranch near Knowlton when a Goshawk seized, and carried past him, a shrieking Blue-winged Teal, just as he was on the point of firing at the latter's companions. The reports caused the hawk to drop the teal into some buck brush but it remained near and, as usual, was of great assistance to the shooter. With a hawk in the neighborhood, ducks rise at close range and are afraid to go clean away. Shortly after the above incident Mr. M. M. Archdale was shooting ducks on his ranch, which adjoins that of Mr. Price, when the same or a similar hawk compelled a flock of teal to return twice to the water from which they had been originally started. He thus made a good bag. On November 19, 1905, my wife saw a Goshawk sitting on the ground watching the poultry at our ranch in Dawson County. On this occasion the hawk did no harm.

During the end of September and beginning of October, 1906, however, a Goshawk frequented this ranch, and killed four pure bred Plymouth Rocks of which we kept a number in two different places. The hawk appeared to lurk on a pine-covered hill about half a mile away, in full view of the windows, from whence, if the coast was clear, it swept across

the creek and alighted in the immediate vicinity of the fowls. The latter were well accustomed to watch for hawks, and any large bird seen in the sky would send them scurrying for shelter. The Goshawk, however, invariably flew so low, that, like the prowling coyote, it was unperceived until the moment of the fatal dash. The fowls became afraid in consequence to leave the immediate vicinity of their houses, and on October 4, the hawk killed a pet white hen at the fowlhouse door, which made its third victim. Despite our rule never to kill wild birds on the ranch, my wife, now that her pet hen was slain, desired to shoot its murderer. On my part I wished to spare this splendid but too audacious hawk, which, although most wary at other times, showed extreme reluctance to leave its prey. As the captured fowls weighed upwards of five pounds each it could not carry them off but ate the back or breast of its victims where they lay. A few days after the white hen episode the Goshawk killed a very fine cockerel and was observed by me almost in the act. To escape its enemy the terrified fowl had run under some young cedars which would have saved it from a Prairie Falcon or Peregrine, but were no protection against the relentless Goshawk which followed and seized its prey within the cover. So great was the strength of this cockerel that it ran an uphill distance of fifteen paces towards the fowl house, burdened with the clinging hawk, ere it fell dead. The Goshawk kills its prey by constriction of the feet, and it is quite certain that the squeeze combined with the shock is rapidly fatal to fowls. On this occasion the hawk must have been unusually hungry, for when deprived of its booty, it alighted in a cedar nearby to watch the proceedings. Returning with a gun I carefully stalked the bird and fired two ineffectual shots as it flew away. The hawk then rose to a great height and, after flying some distance, boldly returned to its haunt on the pine-covered hill above mentioned. Early next morning I observed the bird again fly to the spot where the cockerel had been killed and managed to disable it by a long shot which apparently fractured the ulna of the left wing.

Not being severely wounded the hawk managed to flap into a cedar but was here captured and placed in an empty barn. When handled (of course with thick gloves) the Goshawk from the first made no sort of attempt to show fight, but only looked at me reproachfully with its orange eyes. The plumage and size (which equals the largest dimensions given) determine it to be an adult female. On October 18, 1906, a second Goshawk appeared, resembling the captive in all respects, but did no damage until October 27 when it was surprised in the act of eating a large hen close by the fowl house. The victim was first struck about fifteen yards behind the building but had run this distance down hill dragging the hawk. The evening was exceedingly calm, and the hawk having gorged itself on the entire breast of the fowl in a place walled in by low hills found great difficulty in rising above them. Indeed I think I could have thrown my stick and killed the bird as it was flapping awkwardly "for want of air to

waft her." In thirty-six hours the hawk had returned to the fowls, but, being anxious to avoid the necessity for injuring another of these fine birds, we shut up the poultry with the result that in a few days the Goshawk left in disgust. (Plate X.)

65. *Buteo borealis calurus*. WESTERN RED-TAIL.—Common. In arrival and departure this handsome hawk coincides with *B. swainsoni*, and it may therefore be said to reside here only for three months, the time necessary to rear its progeny. Being seldom killed, this hawk is quite a common bird, breeding throughout both counties, when it chooses an inaccessible cottonwood, the nest being placed as high as possible while the thick foliage renders it all but invisible. I have thus been able to follow the life history of these birds, and one pair nested for several years about two miles north of my ranch in Custer County. I have never known these hawks to have more than two nestlings and, in the case of two nests at least, investigation showed that these were fed upon Meadowlarks, cotton-tail rabbits, and snakes, provided chiefly by the male. Mr. Dan Bowman and Mr. H. Tusler informed me that they took rattlesnakes but in any case, no remains of poultry nor game birds were even found.

66. *Buteo borealis harlani*. HARLAN'S HAWK.—Rare. A hawk of this species was obtained in North Dakota in the spring of 1890 and identified by Drs. P. L. Sclater and Bowdler Sharpe. It is now in the British Museum. I have since seen a similar hawk in Custer County, and one in Dawson County on August 25, 1905.

67. *Buteo swainsoni*. SWAINSON'S HAWK.—Common. My first introduction to these hawks was in April, 1890, when an extraordinary invasion of them — probably nearly two thousand birds — alighted around the ranch where I was staying on the west bank of the Powder River. They came in the afternoon from a southerly direction and, for a time at least, followed the downward course of the river, as a neighbor living above reported the enormous hawk army which flew over. The wide river bottom where the ranch is situated is thickly overgrown with cottonwoods, and the fence of the saddle horse pasture all but joins the buildings. When the last birds had arrived, the trees inside this pasture were simply black with them; but as there appeared to be numbers beyond, I saddled my horse in order to reconnoitre further. This precaution was necessary on account of the Texan cattle herds outside the fence, which were quite unaccustomed to seeing a pedestrian, and would either stampede or follow him about with menacing demonstrations. Having ridden round the fence I found that not only were the trees filled with clusters of buzzards, but that the ground below was covered with them sitting in rows among the cattle, the sight surpassing anything I had hitherto seen in bird life. All were obviously worn out and appeared asleep; but those on the ground, if closely approached, were not too tired to fly up and join their comrades in the trees. In color, as far as could be determined, these buzzards exhibited every shade of brown while some inclined to a more chestnut hue.

Others again appeared black, or almost black, showing the melanistic form, and a very few individuals were a uniform lavender, or bluish ash, like the male Marsh Hawk (*Circus hudsonius*). I have never obtained but two birds in this rare dress, but I feel satisfied it is the one ultimately assumed by the adult male, which through a long succession of browns moults into a mature plumage of lavender with white throat spot. Of this cinereous phase I can find no reference in ornithological works, where the old males are invariably, but I believe quite erroneously, described as brown. The immature birds, both male and female of the same age, also exhibit endless difference in coloration, and the attempt to trace their progress to maturity has perplexed even so eminent an authority as Dr. R. Bowdler Sharpe who states (*in lit.*): "The changes of plumage in these buzzards are terribly difficult to follow." I returned to the ranch for a 250 Holland rook-rifle and walking out in the pasture killed twelve of the Buzzards, at the same time restraining the cowboys from indulging in a general practice with their winchesters. The small crack of the rook rifle, and the headlong fall of a bird from its perch, had no effect upon its companions, but I believe a shot gun would have caused them all to take wing further on. In a letter published in 'The Ibis' (Oct., 1891, pp. 623-625), I gave the estimated number of buzzards at about a thousand; but it became obvious afterwards that two thousand would have been nearer the true count, as twenty trees each containing fifty birds give a total of a thousand without including all those on the ground and in more distant cottonwoods. I may add that my wife and Mr. Coggsall (owner of the ranch), who were present during the flight only saw the birds in the saddle horse pasture, and computed their number at a thousand within the enclosure. Six out of the twelve buzzards were sent to Dr. P. L. Selater and are now in the Natural History Branch of the British Museum. On the following morning all the buzzards had vanished as completely as the Assyrian host, and such an opportunity is never likely to occur twice to any one observer, although I have since seen other small migrations flying over at a considerable height — one flock over the town of Miles City. Some members of the flocks which arrive in April remain here to nest in June, the young being hatched out early in July, and are ready to take wing at the end of that month. As soon as this happens all the buzzards, fortunately for them, leave this part of the country.

68. *Archibuteo lagopus sancti-johannis*. ROUGH-LEGGED HAWK.— Formerly a common winter resident but, like the Golden Eagle, is becoming very scarce from traps and poison put out for wolves. Also observed in spring and fall. I have seen many specimens of these hawks in Montana which perished in the above mentioned manner. Some were indistinguishable from three in my collection of Orkney birds while others were again quite different. Here, prairie dogs appear to be the favorite food of this species and the next, so that both should be strictly protected. I believe that a few pairs breed in the badlands. On May 14, 1898, I discovered

what I supposed to be a nest of this species, as a Rough-legged Hawk was frightened from the spot by my grayhounds which had been chasing a coyote. When I returned on another day the nest was deserted and I took the single egg.

69. **Archibuteo ferrugineus.** FERRUGINOUS ROUGH-LEG.—Resident but never common. Appears to be larger than the last named. A female of this species was caught in a wolf trap near my ranch at Terry which I had preserved. Another female was shot from her nest on a badland butte near the same place by A. Bright on May 9, 1899. I visited this eyrie, took the two eggs, and also saw the male bird. In May, 1905, another pair nested on a cottonwood about six miles from my ranch in Dawson County but a hungry shepherd boiled and ate the three eggs. (Plate XII, Fig. 1.)

70. **Aquila chrysaëtos.** GOLDEN EAGLE.—Formerly very common but has become almost exterminated as a result of the high bounties placed on wolves. In the early years of 1890, eagles had not learned to associate danger with the presence of man and their tameness was indeed remarkable. For three years, 1903,-04,-05, a pair of Golden Eagles nested near my ranch in Dawson County.¹ The female of this pair met a melancholy fate in attempting to carry off what was beyond her strength. All the shepherds had received strict injunctions from their employers not to interfere with the eagles, but in this case the patience of one man was tried too far. He narrated how from some distance away he saw an eagle stoop at one of the dogs, and hang above it as raptorial birds are wont to do when attacking ground game. The dog, not paralyzed like a hare, at the proximity of the great bird, ran towards its master, when the hovering and expectant eagle fixed one foot on each side of the collie's throat and endeavored to bear aloft the shrieking animal. The shepherd described how during the few minutes that he was running toward the struggling pair and trying, incidentally, to find a stick, the eagle made frantic efforts to carry away the dog, which seemed unable, when clutched in this manner, to make any attempt to free itself. According to the story, the bird was flying all the time, in any case flapping its wings, and, although prevented from rising by the weight of the quarry, it was able to drag the helpless dog to and fro. The eagle had, in fact, too good a hold for her own safety and was ignominiously killed by blows on the head with a stick. This event happened at the end of March when the male found another mate, and with her made a new eyrie in a different situation. The dog, which weighed about thirty pounds, afterwards recovered, though rather badly mauled by the eagle's claws. A pair of Golden Eagles have also nested in a tall pine tree for five years (1902,-03,-04,-05,-06) at Mr. J. H. Price's ranch near Knowlton, Custer County, and have been strictly protected. Two eggs taken from this eyrie are the handsomest I have ever seen.

¹ See Cameron, Nesting of the Golden Eagle in Montana. Auk, Vol. XXII, No. 2, April 1905.



GOSHAWK, WITH A SHARP-TAILED GROUSE.



FIG. 1. SPARROW HAWK AT NESTING TREE.



FIG. 2. SPARROW HAWK WITH DEER MOUSE.



FIG. 1. NEST OF FERRUGINOUS ROUGH-LEG ON A BADLAND BUTTE.



FIG. 2. YOUNG WESTERN HORNED OWLS.

71. *Haliaeetus leucocephalus*. BALD EAGLE.—Occasional visitor. Formerly bred here. A pair of Bald Eagles were found nesting in a high pine on the head of Horse Creek by Mr. Dan Bowman in 1893. Unfortunately the female was killed by a bullet as she sat on the edge of her nest, an immense platform of sticks. Mr. Dan Bowman, who was one of the first settlers in this part of Montana, has supplied the following further information. In the early eighties Bald Eagles, while not common, were frequently seen on the Powder River. In 1883, a pair had a nest in a cottonwood tree on the east side about two miles above the rocky ford at the mouth of Coal Creek. Bowman, being camped nearly opposite, could observe the birds, and once saw a lamb carried to the eaglets by one of the parents. In 1885 he again saw an adult Bald Eagle perched on a rock, about two miles north of this nesting site, and approached to within fifty yards. A few days after one was shot by a Mexican, working for Frank Archdale, when Bowman identified it beyond a doubt by the tail and shanks. He has also twice seen dead Bald Eagles on the Powder River, which had died from eating poisoned bait put out for wolves. Mr. J. H. Price has also seen Bald Eagles at different dates, which were probably the same birds observed by Mr. Bowman who lives in the same locality. I have twice seen an adult Bald Eagle on my ranch in Dawson County, — March 17, and November 6, 1905. On the second occasion I was riding up a thinly wooded hill, when the splendid bird floated over me, unsuspectingly, just clearing the straggling pines.

72. *Falco mexicanus*. PRAIRIE FALCON.—Tolerably common resident. For two summers, 1905–06, and probably for many years before I discovered them, a pair of Prairie Falcons have nested half way up one of the highest buttes in the picturesque badlands at the mouth of Cottonwood Creek in Dawson County. At this place there is a sheer wall of peculiar white sandrock which breaks away very easily and disintegrates into a substance as fine as chalk. The cliff contains several holes and the falcon places her eggs upon the white powdery sand in the largest of these under a flat projecting rock. The eggs may be seen either by ascending from below with the aid of a rope and steps cut with a hatchet, or from above by descending the butte and lying full length on the flat rock already mentioned. The latter method, however, requires a cool head. In my experience there are no birds so shy as these, and none whose nest is so difficult to find, or who desert it so easily. In 1906, at this particular eyrie, two eggs were laid by May 10, but the birds carefully avoided the place if a human being was anywhere in the vicinity. When the nesting site is approached, the falcons at first 'ring up,' uttering shrill chattering cries, but should the intruder remain stationary, they endeavor to mislead him as to its true position by circling above the top of another high butte, both wailing like cats. Should the eyrie be actually visited, the birds disappear altogether. For fear that the female might forsake her eggs in the nest above referred to, the cavity containing them was merely looked

into from a yard away at the above date and not visited again until June 15. They were nevertheless found to be deserted. The falcons had chosen another site in a still more inaccessible cliff above the river where they were left undisturbed. The Prairie Falcon is very bold in its attacks upon game birds and poultry, seizing them either on the ground or on the wing indifferently. I have known it to prey upon Mallards, both kinds of Teal, Sharp-tailed Grouse, and domestic fowls. In attacking full grown hens the falcon suddenly checks its stoop about a yard above the victim over which it hovers before making the final dash. Meanwhile the shrieking fowl runs wildly about and there is often time to scare away the freebooter which then mounts with incredible rapidity. At the time of their migration Green-winged Teal seem to be the favorite quarry, and Mr. J. H. Price has twice shot one of these ducks from a flock pursued by a Prairie Falcon before it had made its stoop. This dashing marauder attends upon the Teal as they move up or down the creeks, and in winter is the relentless persecutor of the Sharp-tailed Grouse. I have even seen the falcon watching on a pine for the grouse to emerge from the snow at its foot. On February 7, 1895, an adult Prairie Falcon (now in my possession) was shot by a neighbor, J. C. Braley, at Terry, under peculiar circumstances. His wife was cooking beetroot and threw out the refuse on the snow, when the falcon, passing overhead, stooped to the beetroot which it probably mistook for raw meat.

On September 21, 1904, at our ranch in Dawson County, my wife and I watched a Prairie Falcon in the act of carrying off a Meadowlark which was screaming and struggling in its talons. As the falcon rose level with the hill-tops, a Golden Eagle sailed majestically over in close proximity to it, thereby appearing to fluster the other which allowed its victim to escape. Old birds of *F. mexicanus* may always be distinguished from the young by their yellow feet and legs, as in immature examples these are slate color.

73. *Falco peregrinus anatum*. DUCK HAWK.—A scarce resident. In 1905, there was an eyrie of peregrines not far from the Terry ferry boat crossing. I did not see the eggs, which were laid in an inaccessible fissure about six feet below the overhanging edge of a cliff which towers above the Yellowstone. By crawling along a projecting spur of gumbo it was possible to obtain a good view of the rock face and of the falcon as she flew from beneath, but nothing else could be made out except the excrement of the birds. It would appear that neither the Duck Hawk nor the Prairie Falcon make any pretence at a nest here, the eggs being deposited in the hollows which are often found excavated in the vertical face of hard sandrock.

74. *Falco columbarius*. PIGEON HAWK.—Tolerably common fall migrant. Since 1899 I have many notes of this hawk, but perhaps some of them would properly apply to the next species. I saw five Pigeon Hawks together twice, on August 20, 1899, and July 21, 1904, at which time they flew low over my buggy. I have also twice seen a Pigeon

Hawk dash after a bird (the first time a pigeon the second time a small bird) into an outbuilding right through our astonished party. On September 5, 1899, I witnessed an exciting chase by one of these hawks after an Arkansas Kingbird, which, however, evaded its stoop every time and finally found safety in the brush. My wife has seen several of these hawks sitting on the telegraph wires at Blatchford, and Mr. J. H. Price has also observed them in this locality.

75. **Falco richardsoni.** RICHARDSON'S MERLIN.—Rare migrant. During August, 1904, a hawk of this species came several times to drink at the cattle troughs on my ranch in Dawson County. Captain Platte M. Thorne mentions two specimens which he obtained in the fall of 1889.

76. **Falco sparverius phalaena.** DESERT SPARROW HAWK.—Summer visitor, everywhere abundant. Commonest hawk in eastern Montana. Arrives about the end of March, but all the birds are gone by the middle of October. As a rule the Sparrow Hawk lays her eggs in deserted woodpecker holes but on one occasion she appropriated the nesting site of a flicker after the latter had begun to lay. (Plate XI.)

Upon first arrival Sparrow Hawks are seen to stoop boldly at small birds on the ground, but, as far as my observation goes, they seldom take feathered prey when grasshoppers are plentiful. They hawk for the latter in the early morning, or just before sunset, but do no foraging in the heat of the day when the grasshoppers are most in evidence. About twelve large flying locusts are required to supply a Sparrow Hawk with a meal; as these birds also kill numbers of mice, they are most beneficial and should be strictly protected. The head of the grasshopper is first plucked off and swallowed, the wings and inside are next thrown away, when the bird eats the remainder. I have never known Sparrow Hawks take the chicks either of domestic fowls or of the Sharp-tailed Grouse, even when ample opportunity has been afforded them. Mrs. Gifford of Fallon shot a Sparrow Hawk which arose from among her chickens with, as she thought, one of them in its claws. The poor bird's victim, however, proved to be an English Sparrow. When Sparrow Hawks chase large birds, such as Doves and Meadowlarks, it would seem to be chiefly in play. They are very bold in attacking the different species of Buteo and Marsh Hawks which may approach their nesting site.

77. **Asio wilsonianus.** AMERICAN LONG-EARED OWL.—Resident. Not common. On October 11, 1895, one (female) was shot by the cook of the L. U. cattle outfit on Little Dry Creek, Dawson County, who gave it to me. During October, 1899, a family of two old and five young owls came every night to my haystacks in search of mice at my ranch near Terry, Custer County. They were very tame, and if I rode up after dusk would playfully swoop at my horse. On May 11, 1905, a Long-eared Owl was flushed from a cedar patch at my ranch in Dawson County, and a pair of the birds frequented the same locality in April, 1906. In May, 1905, a pair nested in the hollow of a high cottonwood at the Yellow-

stone ferry crossing at Terry. On June 1, two nearly full-feathered young could be seen sitting in the tree, but as they were the objects of much attention the parents removed them on the night of the second.

Mr. J. H. Price is familiar with this owl in his locality (Knowlton), and informs me that several birds of this species frequented Mr. G. M. Kirwan's ranch, on Tongue River, during the winter of 1906-07.

In fall and winter these owls occupy cavities in the high cut banks of the badlands; Messrs. Archdale found a Long-eared Owl frozen to death in a badland hole. When this owl is in flight, a brown spot shows conspicuously on the buff lining of the wings underneath the primary bases.

78. ***Asio accipitrinus***. SHORT-EARED OWL.—Erratic winter visitor. Tolerably common some winters, in others not observed. These owls lie very close, and are flushed from sage brush precisely as from the heather in the Orkney Isles where they were very common. In either case, they are difficult to see without a dog. On January 10, 1902, my wife picked up a dead Short-eared Owl, in good condition, by the Yellowstone. It must have been frozen to death in the extreme cold of the previous December, as there was no other way to account for its demise. A pair of these owls wintered on my ranch in Dawson County, during 1902-03 and were last seen on April 16. May 7 is the latest date on which I have observed this species.

79. ***Megascops asio maxwelliæ***. ROCKY MOUNTAIN SCREECH OWL.—Captain Thorne mentions three seen by him. I have not observed this owl here.

80. ***Bubo virginianus pallescens***. WESTERN HORNED OWL.—Common. A resident and predominant bird, nocturnal in habit, and to be seen or heard at all seasons wherever there is a tree for it to rest in. Nests indifferently in the river valleys or pine hills. A pair of Hoot Owls reared their young on my ranch in Custer County for many years, repairing the same nest, often but a storm swept fragment, each spring in the same box-elder tree. Almost before winter is fairly over (about third week of March) the female begins to lay the two or three white eggs upon which for about three weeks thereafter, she will sit alternately with the male, who shares the duties of incubation with his spouse. While one of the pair is on the nest, the other sits silent in a tree, its plumage assimilating so closely to the bark, whether box elder or willow, as to render the bird invisible even when the tree is leafless. The young are hatched successively from about the middle of April onwards, and the first hatched nestling may precede the latest arrival by an interval of a week. By the second week in June they can fly. So pugnacious are the owlets that the strongest finally drives the others from the nest to occupy a branch near, where they pretend to fight but avoid the real issue by twirling round and hanging head downwards by their scansorial feet. Hoot Owls have an ill repute as chicken stealers and are shot at sight on neighboring ranches; but the fact that their raids are not commenced till dusk serves generally to protect them.

They were observed to kill half grown turkeys belonging to J. C. Braley, of Terry, in the summer of 1902. The season's menu for our own particular owlets consisted, however, mainly of cotton-tail rabbits, two of which have been seen in the nest at one time. I once saw a young jack rabbit in the nest. (Plate XII, Fig. 2.)

81. *Nyctea nyctea*. SNOWY OWL.—Erratic winter visitor. In some years abundant; in others not seen. During the winter of 1889-90 there was a regular invasion of Snowy Owls, and J. D. Allen, taxidermist, Mandan, N. D., had five hundred sent to him for preservation, which I examined in May, 1890. During the same winter Captain Thorne has records of eighteen in his locality (Fort Keogh) alone. On my trip to the Missouri Brakes from Miles City, in April, 1890, these owls were commonly seen all along the route traversed. I have frequently met with them since in all parts of both counties but never again in such numbers. Snowy Owls alight indifferently on a tree, on a fence, or on the ground, and, in the latter situation, allow a very close approach by a horseman before taking wing. Mr. W. S. Haley informed me that a pair of these owls remained over two summers on Pine Creek, Custer County, and frequently flew into the hollow of a dead cottonwood where they were supposed to have a nest. It is unfortunate that he did not further investigate.

82. *Speotyto cunicularia hypogæa*. BURROWING OWL.—Common resident. In summer these owls have a habit of making short flights along the wire fences in front of horses, perching on the wires until approached quite close.

83. *Claucidium gnoma*. PYGMY OWL.—Rare. A specimen of this owl was obtained in the timber on Tongue River at Miles City by a workman in Moran's saddle shop, where I saw it mounted on January 4, 1895. It was afterwards presented by Mr. Moran to Mr. J. E. Rickards, governor of the State of Montana.

84. *Coccyzus erythrophthalmus*. BLACK-BILLED CUCKOO.—Rare summer visitor, arriving about the end of May. About two pairs nested regularly upon my ranch in Custer County, and the groves resounded with their cries. Mr. J. H. Price, who has a thorough knowledge of Custer County, tells me he never heard them elsewhere. I have heard cuckoos, however, on Ten Mile Creek, ten miles distant, where exactly similar conditions prevail. (See introduction.) In June, 1900, a pair of cuckoos chose the center of a choke cherry for their nest, which was entirely concealed from view by festoons of flowering clematis enveloping the bush. On June 13, when I first discovered this beautiful nest it contained six blue eggs, but unfortunately five young Marsh Hawks were hatched out at the same date on the creek below. On June 19, five nestling cuckoos were hatched but had fallen a prey to the Marsh Hawks by the end of the month.

85. *Ceryle alcyon*. BELTED KINGFISHER.—Not common. Summer visitor to Tongue River, Powder River, and the Yellowstone. Mr. Dan Bowman informed me (*in lit.*) June 4, 1905, that a pair were nesting on

Powder River. On July 31, 1905, when observing a heronry on an island of the Yellowstone, in Dawson County, a kingfisher flew to the island and was apparently one of a pair nesting there. On September 21, 1906, I saw a kingfisher take a fish from Seven Mile Creek (Glendive).

86. *Dryobates villosus*. HAIRY WOODPECKER.—Tolerably common. Must breed in the pine hills, as it is found there all the year round. On Cedar Creek, which runs into the Yellowstone, near Glendive, its short sharp screech and flight in loops attracted my attention nearly every day when hunting deer. According to Mr. Jenkins, this form is *D. v. monticola*. (See Jenkins's 'Variation in the Hairy Woodpecker,' Auk, Vol. XXIII, p. 168.)

87. *Dryobates pubescens oreæcus*. BATCHELDER'S WOODPECKER.—Tolerably common. Resident. Must breed in the pine hills. This woodpecker is much in evidence during winter on cedar fence posts, in which it bores numerous holes searching for food under the bark.

88. *Ceophloeus pileatus*. PILEATED WOODPECKER.—Rare. One seen April 25, 1894; another August 12, 1898.

89. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.—Abundant. Commonest woodpecker here, nesting indifferently in river valleys or pine hills. Arrives about middle of May, leaving about middle of September. A pair which came regularly to my water troughs in Dawson County, during August, 1904, were accompanied by only a single young one. When a hawk appeared they made an extraordinary commotion, and others of the brood might have been taken by hawks. In June, 1905, three pairs of Red-headed Woodpeckers nested in small holes of high cottonwood branches close to the ferryman's house at Terry, and many pairs used the holes in dead pines on my ranch (Dawson County) and vicinity for the same purpose.

90. *Colaptes auratus*. FLICKER.—Common. Breeds in pine hills or river valleys indifferently. Nested on both my ranches.

91. *Colaptes cafer collaris*. RED-SHAFTED FLICKER.—Common. Captain Thorne sent twenty-five skins to Dr. J. A. Allen, American Museum of Natural History, who replied as follows: "The series as a whole is one of special interest, the specimens all coming from localities within the range of the interbreeding of *C. auratus* and *C. cafer*. There is not a specimen in the whole series that is strictly *C. cafer*, though several approach true *cafer* very strongly. The greater part are much more *cafer* than *auratus*. In a few the characters of the two species are about equally represented. In one or two the *auratus* characters prevail. No two specimens are quite alike, while the combination of characters is often peculiar and very interesting."

(To be continued.)

THE CROSSBILLS OF NORTHEASTERN WYOMING.

BY REV. P. B. PEABODY.

THE data set forth herein are much too meager for publication, greatly interesting as are the underlying facts to which they refer. What is here chronicled is hence laid before students of bird biology with suggestive and stimulative intent. It seems incredible that the apparent difficulties in the way of a more intimate knowledge of the nesting conditions that prevail with some of our mid-western races of Red Crossbills should continue to baffle those that have attained skill, through experience, in the unraveling of bird mysteries.

On the shale hills of Weston County, Wyoming, and on the rocky slopes of the Bear Lodge Hills of Crook County, the ever-present bull-pine shelters or nestles, according to their whim, the nomadic flocks of the large-billed form of crossbills that are known as the Bendire Crossbill (*Loxia curvirostra bendirei*). This race is no less irregular in its periodic and seasonal movements than are others of its congeners. Except for a brief time in the very late summer, when the seeds of the bull-pine begin to fail, there would seem to be no time during the annual circuit when the Sierra Crossbill may not be found in northeastern Wyoming. It is rather sparingly resident; and, except for the seasons when it freely breeds, it is irregular in its favored haunts.

Interested, at all times, in the habits of all birds, the writer has, of late years, given special attention to questions of the breeding times of many species of North American birds. He has collated from printed records and gathered from private sources all eligible records for the nesting times of all the crossbill races. For *L. c. minor*, the extreme dates available for record are March 10 and August 6. Of late a September instance (Brewster, Maine) has come to light. For *L. leucoptera*, January 20 and June 12, and for *L. c. stricklandi* (in Mexico), a period extending back into January (perhaps December), and forward to about March 15. (See 'Zoe,' Vol. IV.)

By all analogy, the Sierra Crossbill should nest during February

and March. By all record, the utmost we have to swear by is the vague statement by the late Professor Knight, of the University of Wyoming, that, "in 1897, while in the Bear Lodge Mountain, [he] saw [the Bendire Crossbills] in flocks of several hundred"; that it was "the 24th of July"; and that "the young were full grown." (Univ. Wyoming Bull., No. 55, p. 120). (It is not impertinent to add, that never, under any circumstances, do we in our day, see, on the Bear Lodge Mountain, flocks of crossbills exceeding fifty in number.)

With these inconclusive data for his only guide the writer, during the spring and early summer of 1904, made diligent search for the nests of the Sierra Crossbill; spurred on, with quickened enthusiasm, by the spirited chatterings and the ardent searches for unexhausted pine cones on the part of ever-present and often-numerous birds. And yet the writer does not recall a single instance of any act remotely interpretable as connected with nesting or the care of the young during the entire season of 1904. On December 20, 1904, however, one remarkably sunny and mild day, just before sunset, a most beautiful but previously unheard song came wafted, ventriloquially, to my back door from some near-at-hand bull-pine. The singer was sought out and proved to be a male Bendire Crossbill. He was sitting on the very top of a small pine, quite absorbed in his own tone-productions. For the warblings were real *tones*, though decidedly weak, fitful and soliloquial. They might be characterized as weak but immeasurably sweeter paraphrases of the brilliant song that *L. c. minor* sings, atop the tall spruces of Saint Louis County, Minnesota, during early June.

Scanty attention was vouchsafed the crossbills during the time intervening between December 20, 1904, and the first of February, 1905. Oblivious of the fact that wonderful and fascinating events might be going on, the while, in the crossbill world near by, the writer patiently awaited the time indicated in the books for the probable celebration of the nuptials of his very interesting crossbill friends. On the early morning of February 2, 1905, the writer made the following record in his notes: "This morning, at eight o'clock, with the thermometer at thirty degrees below zero, I saw one of a small flock of about eight crossbills feeding another. The feeder proved to be a male; and I must hasten to look for nests; if, even at so early a date, a crossbill is feeding his mate."

Crossbills were, in the following days, fairly abundant and easy to observe. Yet go where I would, search where I might, over the hills and through the cañons of the vicinage of Newcastle, Weston County, no trace could I find of anything like domestic occupations among the busy crossbills. But on the morning of February 12, but forty feet or so from the small pines whereon I saw the feeding operations of February 2, I found, to my incredulous astonishment, a female crossbill feeding three young in a bull-pine sapling not ten feet high, on the very corner of my church lot.

"A male feeding his mate, indeed," grumbled I to myself, as to the feeding incident of February 2 in the very heart of town. The birds were not four feet from my head, and I had every opportunity of watching them critically for four or five minutes. The three fledglings were very hungry (young crossbills are *always* hungry), and sat on the pine boughs, about their mother, waiting for the filling and the subsequent un-filling of her throat with the bull-pine seeds. One youngster, after being partially filled up, as to his crop, removed a foot or so from the rest of the family and began intently to pry at the bark of the limb on which he sat. (This operation I have seen enacted several times since; and I am quite convinced that it has much to do with the nascent crossing of the mandibles.¹) Eager to secure at least a single example of these young (still believing the rearing of these birds, at so early a date, to be unusual), I searched for them a half-hour later, they having in the meanwhile impulsively flown from the sapling of their morning luncheon to some spot unknown. Fortunately, they were found on the same lot and but fifty feet from the spot where they had just been seen, perched, quite as before, on another pine sapling. With a mop-stick as my weapon, I tried to secure one of the young crossbills. It sat a few inches from its mother, awaiting her good offices. At the stroke of my weapon the fledgling flew — though he was the

¹ There seems to be no apparent law regarding the direction in which the lower mandible crosses the upper. Of fifteen specimens respecting which record has been made, ten were males and five were females. Four of the females had the lower mandible crossing to the left; with one specimen having the mandible crossing to the right. In six males the crossing was toward the right, and in four toward the left. Thus eight specimens had the mandible crossing to the left, and seven to the right. No regularity thus appears; and it is a fair question for speculation whether or not the curvature is not *produced*, indifferently, by each juvenile, according to its own impulses.

nearer to the point of my stroke — while the mother fell at my feet. Repeatedly did I see the father of these young, that same morning, at his task of double parenthood. His round of pasturing seemed very narrow, being confined, in the main, to the few small pines about my residence.

Two days later I secured two of the young crossbills. Of these two, one, the female, had both mandibles as yet absolutely straight; while her brother had a slight crossing of the mandibles at the tips.

Actions of the parent crossbills, repeatedly studied at this time, revealed somewhat of mode and habit. By light of this added knowledge one learned to catch the meaning of acts previously meaningless. Thenceforward it became possible to watch not a few family parties at their feeding; and also to measure the purpose of flights previously without apparent meaning. It thus became plain that the parent crossbills would alternate in making long excursions after pine seeds for the young; the latter remaining, the while, in the manner of so many fledged birds, motionless, but in no sense silent, in the very spot where the departing parent had left them.

The note of the young crossbills, that characteristic note whereby all fledglings direct their homing parents to the hungry throats that await them, is unlike any other utterance of the kind. It is a clear, mellow, cheery, yet rather querulous, utterance. Its ordinary form is a monosyllabic *peet*; or a dissyllabic *peetiv*; which, iterated about once a second, in irregular groups, may become, under stress of unusual eagerness, a resounding *pee-tiv-tiv*. This call, in varying forms and intensities, may be heard all the summer long, where the crossbill families are found; being heard, at times, even when the family is on the wing; and even, as I am quite sure, uttered by birds at least a year old. Indeed, a slight variation of it finds place in the nuptial song of the male crossbills. (The coherence, for long periods, of the crossbill families, is indicated by the fact that female No. 2126 was shot in the act of feeding No. 2125, which is manifestly a bird of the previous season.)¹

Up to April 17, no crossbill nests were found, although minute search was made in all neighboring bull-pine areas affected by the

¹ See next footnote.

birds. On the evening of the date in question, at the end of a day spent in the study of Piñon Jay nesting habits, a junco of doubtful identity and interesting mien attracted my attention midway up the side of a steep, heavily wooded cañon near Newcastle. The junco led me a merry race, but was overtaken just at the point where a little gorge ran downward through the small pines. In a moment a sharp, anxious *chill-chill-chill* note resounded, a few feet away and quite above me, in the pines. A female crossbill was flitting about, most excitedly, with tail a-jerk, quite English Sparrow fashion. A prompt hiding amid scanty covert on my part made no change in her goings and comings; quickly marking the spot, I ran back a hundred yards for my note-books. On returning to the crossbill site, all things near at hand were found to be silent and deserted. A few moments of search, in the dim light, gave no clue, but the instinct of telepathy proved a better help. In a very slender six-inch pine, about sixteen feet high, something like a nest appeared some twelve feet from the ground, slightly concealed by sparse pine branchlets. At a sharp rap on the stem of the tree, the female crossbill left the nest. The eager antics of the climber alarmed her not a little, and she kept flying about, ever iterating her excited, *chill-chill-chill*; a call which I had never heard before, save when, a few weeks previously, a pair of birds assailed me with the same call, in a cañon bottom, after the loud, echoing discharge of my gun. The crossbill nest contained two young. These, to the best of my judgment, were two or three days old. The nest was, in all essentials except that of the placing — which was in a semi-vertical fork — like typical nests of the Piñon Jay. It was basally formed of fine twigs and plant stems, and was lined with grass and hempen fibers. The outer diameter is about seven inches; the inner is one and one fourth inches, and the cavity two inches across. While I was examining the nest and young, the mother disappeared; and the delighted observer hastened away, for the night air was chill for the callow young. On April 22, I found the mother crossbill brooding. Upon a rap on the tree-stem, she flew away and did not return. One young had disappeared, while the other had doubled in size, during the interim of five days. On the day following I found the nest deserted and empty. My surmise is, that the Piñon Jays, which were passing continually by in their

townward scavenging for the benefit of their young, had picked up the two young crossbills, one after the other, in the probable absence of both parent birds. It is even possible that the youngsters were removed to places of safety by the mother crossbill herself.

No later nests were found; but families, with young noisily clamoring for food, were heard all summer long. In the great majority of cases, the broods were of three only; but two broods, at most (and possibly but one of these), exhibiting four young birds. Examination of my small series of crossbills shows that birds of a year old, and a little over, were sexually neutral.¹ These were constantly in company with families containing young. These family groups were noticed throughout the summer of 1905, until September. On the Bear Lodge slopes of Crook County a few such were seen early in September; the mature birds even yet exercising parental care over the juveniles, though not probably feeding them. The young still clamored to be fed; but no act of feeding was clearly and indisputably seen.

True to the erratic habit of their kind, the Wyoming crossbills were notably few in number during October, 1905. The same condition prevailed into November; an ardent and repeated search among the shale-hill pines revealing but a scattered bird, here and there. Determined, however, to fix the time of nascent breeding conditions, I sought the crossbills at stated times to the end of November. On the 27th I was rewarded by finding what

¹ It should be stated here that both Dr. Bishop and Dr. Dwight consider certain supposedly year-old birds, from the region exploited in this article, to be strictly birds-of-the-year. One such Dr. Bishop believes to have been hatched from November eggs. Other specimens in similar transition plumage were being fed by parents. If the Doctors be right in their judgment in these cases, the problem of nesting time for crossbills in Wyoming is even more complicated than one had previously supposed; while the long time of parental feeding becomes thus the more incredibly lengthened. Of course it would be quite impossible for a juvenile crossbill to feed itself before the mandibles were fully developed; yet it becomes a matter of surprise that birds in transition plumage, with fully developed mandibles, should follow parents and clamor for food, being apparently, in such cases, sometimes actually fed.

It should be added that a fair series of juveniles has been taken in the Wyoming hills for the express purpose of throwing light upon the length of time required in the maturing of the bill of the crossbill. Birds with mandibles about one third developed, while wearing still the juvenile plumage, were taken in late March, April and June; while all birds taken in transition plumage were of perfect beak-development. Study of records for birds taken do not show that these transition juveniles were any more abundant in March, for example, than they were in late May.

appeared to be a family of the past summer, still together. The adult male was still not an adult, if the reader will permit the contradiction. His plumage was still semi-juvenile. Yet he was in breeding condition, the testicles being of nearly maximum size. The testicles of the Red Crossbill are relatively very small; and, moreover, the two diameters are nearly equal. Measurements taken at various times during the breeding season gave the diameters .20 and .19 as about the maximals. For the November 27 male just referred to, the diameters were .17 and .19. The mature female of the November 27 family had the ova slightly nascent. The two juveniles were both females with ovaries inactive. All four birds were slightly moulting. Crossbills continued few into December, in both counties. A mature female taken December 9 had two or three ova enlarged about one diameter. Data obtained from December to late March were both meager and inconclusive. However, a male taken March 10 had the testicles quite shrunken (only $.15 \times .17$), while his mate (which was shot accidentally) was manifestly incubating.

Four days later, March 14, in a driving snowstorm, I found a finely plumaged male feeding a fully fledged young female. These two birds were taken a few days later, in the midst of intense cold. No sign of the mother bird was seen, nor did a careful search reveal a second nesting.

All through the summer of 1906, as careful and exact a study as possible was made of the actions of the breeding birds. It was found that, while normally as tame as one might expect from all analogies, both males and females were very shy and restless during March, April and May. The excited *chill-chill-chill* note was often heard; and individuals of both sexes might be occasionally seen and heard perched high on the summits of dead-topped pines, with every possible manifestation of nervous unrest and anxiety, and after a brief moment, and without apparent cause, flying swiftly away and disappearing in the distance. During the period indicated most birds appeared to be in pairs; those that were not in pairs being adjudged to be non-breeding birds. No nests, whatever, came to light during 1906. Strong effort was made all through the summer to learn the utmost possible as to nesting habits and ways. And yet, notwithstanding an abundance of pine

mast, the birds were everywhere few in numbers and inconsequent in action.

No signs, whatever, were discovered of late summer nesting. Removal from the region of observation made it impossible for me to determine whether or not the crossbills were sexually active during July and August.

CHARACTERISTIC KAMCHATKAN BIRDS.

BY AUSTIN H. CLARK.

*United States Fish Commission.*¹

FROM the 17th to the 20th of June this past summer, I was fortunate enough to be in that out-of-the-way and seldom visited town, Petropaulski, Kamchatka, where I had an opportunity to form a close acquaintance with a number of interesting birds which I had previously known only from museum specimens. I reached Petropaulski from Bering Island, after having spent nearly a month in the bleak and desolate Aleutian chain; and the sight of the pretty wooded hills about the town, the broad meadows, and the distant snow-covered mountains, combined with the songs of hundreds of birds all about produced a deep impression, and made me think at the time that there could not exist a more charming spot than this little town in farthest Siberia. The weather during my stay was perfect, warm and summerlike, the sun shining almost all the time, which I was in a condition to appreciate, as the sun is a rather rare sight in the Aleutians, and comfortable days, at this season, rarer still.

The first bird in Kamchatka to attract attention is the Siberian Ruby-throat (*Calliope calliope*), not from its coloration, for it is rather plain, nor for its ubiquitousness, for it is quite retiring, but for its most exquisite song. It is abundant about Petropaulski, and sings all day long, from sunrise to sunset, its song being the most characteristic bird note of the region. It inhabits particularly hillsides grown up to bushes, and bushy patches in the mead-

¹ Published by permission of the Commissioner.

ows, keeping usually on or near the ground, and is very adept at slinking away through the undergrowth when alarmed. The song is usually given from some little elevation, as the top of a bush, or the lower limbs of a small tree, but often from near the ground. Very justly has this bird been called the "Kamchatkan Nightingale."

Next in importance as a songster, and much more often seen, being in fact quite familiar about the town, is the Siberian Housefinch (*Carpodacus erythrinus grebnitzkii*). In general habits and song this bird resembles our common Purple Finch (*Carpodacus purpureus*). This species frequents the hillsides, but keeps to the more open places, the higher branches of the small trees, and the tops of the bushes. It is vivacious and restless, never stopping long in one place.

The last of the really characteristic songsters occurring about the outskirts of the town is the handsome Yellow-breasted Bunting (*Hypocentor aureolus*) which is very common, but hardly equal vocally to the two preceding. It is much like the preceding in habits, but less active, and less familiar. An allied species (*H. rusticus*) with a white breast is not uncommon, but I did not succeed in identifying its song.

A near relative of the famous Skylark (*Alauda arvensis blakistoni*) is common in the meadows, its fine song characterizing the more level country behind Petropaulski.

Although not a song bird in any sense of the term, but a bird whose notes are characteristic of this region, as those of its representative are of the western palaearctic region, the common Eastern Cuckoo (*Cuculus canorus telephonus*) deserves special mention. Its loud and clear *cuck'-oo*; *cuck'-oo* was heard at all times, and the birds themselves were frequently seen about the hillsides or clumps of bushes in the meadows.

One of the most curious birds of this region is the Slate-colored Bunting (*Tisa variabilis*). It inhabits the densest alder thickets along the banks of the small streams, keeping on or near the ground, its habits closely resembling those of our Juncos, and sparrows of the genus *Zonotrichia*, to which genus it has been referred by some authors; others have placed it in *Hypocentor*, *Emberiza*, *Fringillaria*; while one suggests that possibly it should be placed in *Spizella*, with our Chipping and Field Sparrows. Recently, however, a

genus has been erected for its reception. In full breeding plumage this bird is almost entirely clear slaty gray, and bears a most striking resemblance to two widely different species, *Phrygilus unicolor* of western South America, and *Junco vulcani* of Costa Rica.

Of the larger species the Slaty-backed Gull (*Larus schistasaugus*) is the most abundant, occurring everywhere about the sea-coast, with the Black-headed Gull (*Larus ridibundus*), a close second, although much more restricted in general distribution. The Osprey (*Pandion haliaëtus*) is very common about here, and the large Kamchatkan Sea Eagle (*Thalassiaëtus pelagicus*) is frequently seen. The Raven (*Corvus corax kamtschaticus*) occurs here, and is not uncommon, although I saw but one or two. The eastern Carrion Crow (*Corvus corone orientalis*) is numerous, and was breeding at the time of my visit. I found a number of nests, none of them, however, accessible. One of the handsomest birds of the region, and certainly the most conspicuous, is the large Kamchatkan Magpie (*Pica pica kamtschatica*), which is common everywhere, although it is very wary, and manages to keep well out of gunshot.

Whenever I went near any groves of tall trees, I was sure to hear a continuous hooting, somewhat resembling that of the Barred Owl; but when I tried to get close enough to find out what was doing the hooting, it would invariably cease long before I was within range, to be immediately resumed from some distant grove. I suppose the bird was the Siberian Hawk Owl (*Surnia ulula doliata*) which is the only owl known from the country.

About the taller trees also, the eastern Tree Pipit (*Pipastes maculatus*) was common, its song and actions instantly calling to mind our common Ovenbird (*Seiurus aurocapillus*). I met with a number of other species of birds here, but all of much less interest than those mentioned. A word must be said in closing about the pretty Kamchatkan Wagtail, which is very common here, especially about the rocky beaches. It is rather shy and hard to approach, resembling in this, as in its general appearance at a distance, the common Snowflake (*Passerina nivalis*).

I was forced to leave Petropaulski early on the morning of the 20th, for Hakodate, which I did with great regret, as few places which I have visited have so appealed to me from an ornithological point of view as this pretty little Kamchatkan town.

WINTER BIRD NOTES FROM EXTREME SOUTHERN
ILLINOIS.

BY JOHN F. FERRY.

THE following notes were made on a short collecting trip to extreme southern Illinois in the interests of the Field Museum of Natural History, Chicago. The time spent was between February 22-28, and the object of the trip was to make as complete a study as possible of the bird life at this season of the year. The region studied was that in the vicinity of Cairo, which city is situated at the juncture of the Mississippi and Ohio Rivers. The area included was about forty-five square miles, and besides Cairo, the villages of Mound City and Olive Branch were visited. The country near the two rivers mentioned is low and flat and is regularly submerged twice each year, at the times of the spring and fall rises of the rivers. Heavy levees for protecting villages and for carrying railroads and highways are practically the only elevations to be seen. At Olive Branch the country is diversified with low wooded ridges and hills and about two miles to the southeast lies a shallow lake of about five square miles area known as Horse-shoe Lake. Cypress is the prevailing growth about it but oaks, sweet gum, sycamore and sassafras form a considerable part of the surrounding forest. Originally the whole region under consideration was one of continuous forest, and much of this primitive condition still remains, although considerable areas have been cleared for farming. Frequent streams of varying size flow in a general southerly direction into the Ohio River. The most important of these is Cache Creek, a mile below Mound City. The soil is mostly a rich alluvial loam, while back from the rivers gravels, sand and clays prevail. The richness of the soil and the prolonged season of summer heat produce a luxuriant vegetation, and trees along the rivers grow into magnificent specimens of their kind.

The weather was changeable, cloudy weather predominating, but for about two hours preceding and following midday warm bright weather usually occurred. The effect of this warmth and sunshine upon bird life was very noticeable, a marked increase in species and individuals being observed during the continuance of

these favorable conditions. Rain fell continuously on the 23d except for part of the afternoon, and rain or mist were the accompaniments of a part of about half the days spent. Occasional touches of green in the meadows showed that the grass was beginning to revive. Frogs were heard croaking on the 24th; on the 26th a black and brown caterpillar (*Pyrrharcetica isabella*) was seen, and small winged insects in low bushes on the river banks were seen daily. Through the courtesy of the U. S. Weather Bureau at Cairo, I am able to give the daily condition of the weather.

Statement of Weather, Cairo, Ills.

Feb. 1907	Temper- ature.			Wind.			State of Weather.		Notes.
	Maximum.	Minimum.	Precipitation, inches.	Prevailing direction.	Total daily movement.	Highest daily velocity.	Character of days.	Percentage of cloudiness.	
22	30	21	T	N E	309	20 E	Cloudy	10	Fresh winds for 24 hrs.
23	42	29	2.30	E	238	16 S E	Cloudy	10	Heavy sleet storm.
24	49	34	.56	N	314	24 N	Cloudy	10	Brisk winds last 12 hrs.
25	45	30	T	N E	218	15 E	Cloudy	10	
26	48	39	.29	E	141	12 W	Cloudy	10	
27	53	34	.0	N E	151	14 E	Cloudy	8	Dense fog 5.30 A. M. to
28	57	44	.04	E	121	11 S E	Cloudy	10	9.05 A. M.

Larus sp?—Gulls flying at a distance from the shore over the Ohio River could not positively be identified as *delawarensis* or *argentatus*; but they were undoubtedly one or the other.

Lophodytes cucullatus (?). HOODED MERGANSER.—Four ducks; undoubtedly of this species, passed just out of gun-shot on Horse-shoe Lake on Feb. 28.

Anas boschas. MALLARD.—Two Mallards were positively identified on Horse-shoe Lake on February 28, and they doubtless formed a considerable part of numerous flocks seen flying overhead at a considerable height. Hunters report them common here during the spring migration.

Spatula clypeata. SHOVELLER.—Four Shovellers were seen on Horse-shoe Lake on February 28. They were very active, either swimming rapidly about or making short, frequent plunges into the shallow water.

Dafila acuta. PINTAIL.—Pintail were probably the most abundant duck at this place. Several flocks were seen flying in a northerly direction

on February 26, and almost daily they were observed in varying numbers. Horse-shoe Lake has several times been the site of an extensive duck-roost largely occupied by these birds. An open space of water was fairly covered with the birds' cast-off feathers.

Branta canadensis. CANADA GOOSE.—During cloudy weather the sonorous honks of the Canada Geese could frequently be heard, but the birds' whereabouts was a matter of mystery. They were probably flying overhead, but they may have been resting on the Ohio River, or on sand-bars, or in neighboring fields. In cornfields hunters had within a few days been successfully decoying them to blinds by the use of corn, shelled and on the cob. They are common in this region during migration.

Fulica americana. AMERICAN COOT.—Four were seen on February 28, at Horse-shoe Lake.

Oxyechus vociferus. KILLDEER.—Ten Killdeers were seen on February 23 in company with a large flock of Robins and a few Meadowlarks, in a wet field. Individuals were seen on February 25-27.

Colinus virginianus. BOB-WHITE.—Common, but each year the season's increase is about killed off by shooters.

Meleagris gallopavo silvestris. WILD TURKEY.—Two hunters and trappers, old residents of Olive Branch, reported a flock of 12-15 of these birds in the immediate vicinity. Several Wild Turkeys had been seen while the writer was in the neighborhood. The home of these birds is in the thickly timbered river bottoms, or in borders of cypress swamps such as are found about Horse-shoe Lake. They frequently resort to the higher timber land or make visits to farmers' fields where they find a scanty supply of last season's grain. Their scratchings are frequently seen in the underbrush. They readily decoy to an imitation of their call. They seek safety by rapid and noiseless running through the underbrush, and take wing only in an extremity. A favorite place of concealment is a bunch of mistletoe.

Zenaidura macroura. MOURNING DOVE.—Two seen on February 27 on Cache Creek, and on the following day two were seen at Olive Branch.

Cathartes aura. TURKEY VULTURE.—Fairly common at this season. Not seen during the coldest weather, February 22 and 23.

Accipiter cooperi (?). COOPER'S HAWK (?).—Three pointed-winged, long-tailed hawks, seen flying high on February 23, were identified as this species with reasonable certainty.

Buteo borealis. RED-TAILED HAWK.—Several seen. One pair's intention of nesting were inferred from their frequent crying and their reluctance to leave a certain portion of the forest.

Haliaeetus leucocephalus. BALD EAGLE.—Occasionally seen about Cairo, near the Ohio and Mississippi Rivers. An immature bird was killed about the middle of January near Hough, Mo., thirty miles distant, where the man who showed me the bird in the flesh reported that the birds were abundant.

Falco sparverius. SPARROW HAWK.—One seen on February 26.

Syrnium varium. BARRED OWL.—Two seen, and reported quite common by trappers. They are some times very annoying to trappers by setting off meat-baited traps.

Dryobates villosus. HAIRY WOODPECKER.—Tolerably common, but much less abundant than the following species.

Dryobates pubescens medianus. DOWNY WOODPECKER.—An abundant bird in this region. The males appeared to predominate, as five males and one female were taken.

Centurus carolinus. RED-BELLIED WOODPECKER.—Common. They show a decided fondness for the tall soft-wood timber of the river bottoms. The large proportion of decayed tree trunks in such places is the probable explanation.

Colaptes auratus luteus.—First seen February 23. Tolerably common thereafter.

Otocoris alpestris praticola (?). PRAIRIE HORNED LARK (?).—Two Horned Larks, seen flying overhead on February 25, were presumed to be this species.

Cyanocitta cristata. BLUE JAY.—Common. A disposition to imitate the cry of the Red-tailed Hawk was manifested by the birds of this region. An almost perfect imitation was given by several different jays.

Corvus brachyrhynchos. AMERICAN CROW.—Common.

Agelaius phoeniceus. RED-WINGED BLACKBIRD.—Two seen at Mound City on February 23. Quite common at Olive Branch on the 28th.

Sturnella magna. MEADOWLARK.—Common, keeping in small flocks, and wary.

Carpodacus purpureus. PURPLE FINCH.—Tolerably common; feeds on 'buttons' of sycamore tree.

Astragalinus tristis. AMERICAN GOLDFINCH.—Seen at Mound City and Olive Branch.

Zonotrichia albicollis. WHITE-THROATED SPARROW.—Tolerably common. Once, song heard.

Spizella monticola. TREE SPARROW.—Common. One evening about dusk a flock of these birds was seen picking up weed seeds on the ground when it was so dark the birds could scarcely be seen.

Junco hyemalis. SLATE-COLORED JUNCO.—Common, roving through the woods or flitting about shrubbery in flocks. In one grove, free from underbrush and where there was a thick carpet of fallen leaves, I came upon a host of these birds. They were alternately feeding among the dead leaves and flying to the nearest branches, where they poured forth their musical trills. When thirty or forty birds were singing at once a most beautiful medley filled the neighborhood.

Melospiza cinerea melodia. SONG SPARROW.—Tolerably common, occasionally singing.

Melospiza georgiana (?). SWAMP SPARROW (?).—One undoubtedly seen on February 24 in a patch of brown beard grass (*Andropogon scaparius* Michaux).

Passerella iliaca. FOX SPARROW.—First seen on February 24, and tolerably common thereafter.

Pipilo erythrophthalmus. TOWHEE.—Male and female seen on February 24.

Cardinalis cardinalis. CARDINAL. Abundant, the males constantly singing. Their brilliancy of color and song made them a most striking feature of the leafless woods. A male and female were frequently seen consorting together. They may have been mated in these cases.

Ampelis cedrorum. CEDAR WAXWING.—Quite common in flocks. One specimen had its throat stuffed with mistletoe berries.

Lanius ludovicianus (subsp ?).—A Loggerhead Shrike was seen on February 24.

Dendroica coronata. MYRTLE WARBLER.—Abundant. The cane-brake at one point along the Ohio River was fairly alive with these birds. They were pursuing small winged insects.

Mimus polyglottos. MOCKINGBIRD.—Three or four individuals were seen each day, February 23–25.

Thryothorus ludovicianus. CAROLINA WREN.—Tolerably common. Its clear warbling whistle would suddenly break forth from some cover of underbrush or river-drift with amazing loudness.

Thryomanes bewicki. BEWICK'S WREN.—One specimen was collected in low, damp woodland.

Certhia familiaris americana. BROWN CREEPER.—Tolerably common.

Sitta carolinensis. WHITE-BREASTED NUTHATCH.—Seen on February 26 and 28.

Bæolophus bicolor. TUFTED TITMOUSE.—The most frequently seen and most characteristic bird at this time and place. Frequently calling.

Regulus satrapa. GOLDEN-CROWNED KINGLET.—Two seen on February 26.

Merula migratoria. AMERICAN ROBIN.—Common in flocks. Not heard singing.

Sialia sialis. BLUEBIRD.—One or two seen each day from February 22 to 28.

Through the courtesy of Prof. H. A. Gleason, instructor in Botany at the University of Illinois, I am able to give a list of the following trees and shrubs which grow in the vicinity of Cairo.

Ordinary Swamps.

Trees.

<i>Acer rubrum,</i>	<i>Salix amygdaloides,</i>	<i>Populus deltoides,</i>
" <i>saccharinum,</i>	" <i>nigra,</i>	<i>Quercus palustris,</i>
" <i>negundo,</i>	<i>Celtis mississippiensis</i>	<i>Liquidambar styraciflua,</i>
<i>Gleditsia triacanthos,</i>	<i>Platanus occidentalis,</i>	<i>Nyssa sylvatica,</i>
<i>Hicoria pecan,</i>	<i>Populus heterophylla,</i>	<i>Fraxinus lanceolata.</i>

Shrubs.

<i>Cephalanthus occidentalis</i> ,	<i>Planera aquatica</i> ,
<i>Rosa carolina</i> ,	<i>Salix interior</i> ,
<i>Adelia acuminata</i> ,	<i>Ilex decidua</i> ,
<i>Rhamnus caroliniana</i> ,	<i>Benzoni benzoni</i> .

Cypress Swamps.

All of the above and the following: Trees, *Taxodium distichium*, *Fraxinus profunda*, *Catalpa speciosa*. Shrubs: *Styrax americana*, *Itea virginica*.

Flood-plain forest, (trees and shrubs not found in above places).

Trees.

<i>Quercus alba</i> ,	<i>Fagus americana</i> ,	<i>Ulmus fulva</i> ,
“ <i>macrocarpa</i> ,	<i>Tilia americana</i> ,	<i>Fraxinus quadrangulata</i> ,
“ <i>platauridæ</i>	<i>Juglans cinerea</i> ,	<i>Gymnocladus dioica</i> ,
“ <i>imbricaria</i> ,	<i>Hicoria orata</i> ,	<i>Betula linta</i> ,
<i>Celtis occidentalis</i> ,	<i>Liriodendron tulipifera</i> ,	“ <i>nigra</i> .
<i>Acer saccharum</i> ,	<i>Ulmus americana</i> ,	

Shrubs.

<i>Carpinus caroliniana</i> ,	<i>Aralia spinosa</i> ,	<i>Alnus nigrosa</i> ,
<i>Ptelea trifoliata</i> ,	<i>Adelia acuminata</i> ,	<i>Arundinaria tecta</i> ,
<i>Malus coronaria</i> ,	<i>Asimina triloba</i> ,	<i>Cercis canadensis</i> ,
<i>Euonymus aleopurpureus</i> ,	<i>Xanthoxylum americanum</i> ,	<i>Staphylea trifolia</i> .

ON A COLLECTION OF BIRDS FROM WESTERN
COSTA RICA.

BY OUTRAM BANGS.

IN 1891-1892 Mr. Geo. K. Cherrie made a famous collection of birds for the National Museum of Costa Rica, on the Rio Grande de Térraba in western Costa Rica, a region at that time practically unknown ornithologically. He subsequently published a long paper¹ on the results of his trip in which he described as new one species — *Henicorhina pittieri* — and recorded the occurrence for the first time in Costa Rica of ten more, — *Basileuterus veraguensis*, *Hylophilus viridiflavus*, *Saltator albicollis*, *Capsiempis flaveola*, *Synallaxis albescens*, *Automolus pallidigularis*, *Gymnocichla nudiceps*, *Dendrobates ceciliæ*, *Melanerpes chrysauchen* and *Centurus tricolor*.

Mr. C. F. Underwood, whose name is so familiar to naturalists the world over interested in the biota of Central America, had always felt that much yet remained to be done in Cherrie's Boruca region, and for a long time had urged me to let him make a trip there in the spring and summer — Cherrie's work having been done in the autumn and winter. Through the generous interest of John E. Thayer, Esq., this was finally arranged, and Underwood started from San José in March, 1906. He stopped for a short time, both going and coming, at Punta Arenas and Boca Barranca in the Golfo de Nicoya, where he collected a few birds, but the main part of his time was spent on Cherrie's old ground on the Rio Grande de Térraba, where he worked from April to August. The principal localities at which he collected here, are Pozo del Rio Grande, 500 feet altitude to sea level; Lagato, 800 feet altitude; Barranca, Paso Real and Terraba, all about 1,000 feet altitude; and Boruca, about 1545 feet altitude.

His collection, numbering nearly 6,000 skins, is a very fine one, and in the following pages I describe from it as new — *Micrastur*

¹ Exploraciones Zoológicas | efectuadas | en la parte meridional de Costa Rica | por los años de 1891-92 | I | Aves | par | Geo. K. Cherrie | Taxidermista del Museo nacional, | 1893, | San José de Costa Rica. | Tip. Nacional.

interstes, *Gymnocichla nudiceps erratilis*, *Synallaxis albescent latitabunda*, *Dendrocolaptes sancti-thomæ hesperius*, *Leptopogon pileatus faustus*, *Cyanerpes lucidus isthmicus*, and *Buarremon costaricensis*. One overlooked, but well marked subspecies, *Glaucis hirsuta æneus* (Lawrence) is reinstated, and twelve birds are recorded, for the first time, I believe, from Costa Rica — *Asturina nitida*, *Cataptrophorus semipalmata*, *Ereunetes occidentalis*, *Chæmepella minuta*, *Elainia chiriquensis*, *Myiarchus lawrencei bangsi*, *Catharus griseiceps*, *Troglodytes musculus inquietus*, *Eucometis spodocephala stictothorax*, *Emberizoides sphenura hypochondriacus*, *Sporophila gutturalis*, and *Saltator magnoides intermedius*.

Original conditions still prevail in western Costa Rica, and there are enormous stretches of virgin forest and perfectly wild country, and the lowland forest birds are safe for a time at least. I have, however, grave fears that many of the very rare and still but little known species of the Atlantic lowland forest are doomed. The banana industry is sweeping away the forest at a terrible rate, and in the few years since the United Fruit Company established itself at Port Limon the forest has been entirely cleared away not only directly about that place, but way south into the famous Talamanca District. Very few of the forest birds take kindly to banana plantations, and as the forest goes they go with it.

The great difference between the lowland forest ornithology of the Atlantic and Pacific sides of the main cordillera in Costa Rica is too well known to need special comment here, but the sliding past each other of northern and southern forms is very remarkable — instance after instance could be given of a bird whose Central American form extends down the Atlantic lowlands, and whose Panamanian form pushes north up the Pacific slope, often passing each other, the mountains, however, between their respective ranges preventing them from intergrading or even meeting. It is largely to this cause that Costa Rica owes its very extensive bird fauna, numbering well over 700 species and subspecies, and that in a country scarcely bigger than the state of Florida.

In connection with the making and identifying of the present collection, I beg to express my sincerest thanks to many of my friends — in the first place to John E. Thayer, Esq., who generously furnished the necessary funds for Underwood's expedition, and

then to Dr. Robert Ridgway, Mr. E. W. Nelson and Mr. J. H. Riley, who made many comparisons for me with material in Washington.

A complete catalogue of Underwood's collection made in western Costa Rica in the spring and summer of 1906, in which colors, when definite names are given them, are according to Ridgway's 'Nomenclature,' and all measurements are in millimetres, is as follows:

ARDEIDÆ.

***Butorides virescens maculata* (Bodd.).** Two males, one fully adult the other youngish, Pozo del Rio Grande, April.

These skins agree with others from Panama, etc., and in my opinion are identical with the bird of the West Indies.

ANATIDÆ.

***Querquedula discors* (Linn.).** Four adults, one male, three females, Pozo del Rio Grande, April.

FALCONIDÆ.

***Micrastur interstes* sp. nov.**

One young male Pozo del Rio Grande, Aug. 4.

Type, from La Estrella, Cartago, Costa Rica, adult ♂, No. 16414, coll. of E. A. & O. Bangs, collected Mar. 28, 1903 by C. F. Underwood.

Characters. Similar to *Micrastur guerilla* Cassin of Mexico, Guatemala, Honduras etc. but slightly larger, the adult male with the underparts darker — the dusky bars broader and the pale interspaces narrower and grayer, less purely white, in color; the whole belly, thighs and under tail coverts heavily barred with dusky, whereas in *M. guerilla* the middle of the belly is white (unbarred or nearly so) and the thighs and under tail coverts are narrowly barred, the dusky bars far apart; white bands on tail wider, more conspicuous and more complete. The adult female differs from that of *M. guerilla* as does the male, but the differences are not so marked as in the other sex. Young birds of the new form are much more heavily barred below than young of *M. guerilla*, and the barring includes the belly, which is plain in *M. guerilla*, and the ground color is darker and more ochraceous.

Measurements.

No.	Sex.	Wing.	Tall.	Tarsus.	Culmen.
16414 Type,	♂ ad.	170	157	56	18
16413 Topotype,	♀ ad.	179	161	58.5	21

Remarks. There is no doubt that the small species of *Micrastur* with barred underparts very much need careful reviewing; the reviews of Ridgway and of Gurney being based on much too scanty material. Still, after going over the whole matter very carefully, I cannot find that the bird of Costa Rica and Panama has ever been named, and as it certainly is different from *M. guerilla* of Mexico and northern Central America on the one hand and from *M. zonothorax* (Cab.) of Colombia and Venezuela on the other, I venture to give it a name. Formerly¹ I had referred a bird from Divala, Chiriqui to *M. zonothorax*, but this specimen belongs to the new form here described from Costa Rica.

Geranospizias niger (*Du Bus*). One adult male, Pozo del Rio Grande, April 6.

Accipiter bicolor schistochlamys *Hellmayr*. Two males, one adult, one young, Boruca and Pozo del Rio Grande, May and August.

Asturina nitida (*Lath.*). One fine adult male, Pozo del Rio Grande, April 3.

This hawk has not previously been taken, I believe, so far north as Costa Rica.

Rupornis ruficauda (*Sc. & Salv.*). Three adults, both sexes, Boruca and Pozo del Rio Grande, April and May.

Elanoides furcatus (*Linn.*). Two adults, male and female, Boruca, April 25.

Leptodon cayennensis (*Gmel.*). One adult male, Pozo del Rio Grande, Aug. 4.

Cerchneis sparveria (*Linn.*). One female, Boruca, May 6.

I cannot attempt to say to what subspecies this specimen is referable, as it is in exceedingly abraded plumage.

Pandion haliaëtus carolinensis (*Gmel.*). One male, Barranca Puntarenas, Aug. 12.

TINAMIDÆ.

Tinamus castaneiceps *Salvadori*. Seven specimens, adults of both sexes and one youngish male, April and August. The young example, which is moulting, has the back and wings irregularly marked with small yellowish spots.

Crypturus soui modestus (*Cab.*). Twelve specimens, adults of both sexes and two chicks, one taken April 19, the other May 24. The larger of these, though no bigger than a sparrow, has the wing feathers all well grown and undoubtedly flew well. Boruca and Pozo del Rio Grande, April, May and August.

CRACIDÆ.

Crax panamensis *Ogilvie Grant*. Two adult males, Pozo del Rio Grande, April 8.

¹ Auk, Vol. XVIII, October, 1901, p. 358.

Penelope cristata (Linn.). Six adults, both sexes, Pozo del Rio Grande, April and August.

Ortalis cinereiceps Gray. One adult male, Boruca, April 25.

ODONTOPHORIDÆ.

Odontophorus castigatus Bangs. Seven specimens, adults of both sexes, and one nearly grown young, Boruca and Pozo del Rio Grande, April and May.

RALLIDÆ.

Aramides cajanea (Müll.). One adult female, Boruca, May 13.

CHARADRIIDÆ.

Ægialeus semipalmatus (Bonap.). One adult male, Puntarenas, Aug. 20.

Ægialitis collaris (Vieill.). Eight specimens, adults and youngish, both sexes, Pozo del Rio Grande and Barranca Puntarenas, April and August.

Catoptrophorus semipalmatus (Gmel.). One specimen, in partly barred plumage, Puntarenas, Aug. 13.

I believe this is the first actual record for the Willet in Costa Rica.

Tringoides macularius (Linn.). Seven specimens, both sexes, all in spotted plumage but one, Barranca Puntarenas and Pozo del Rio Grande, April and August.

Ereunetes occidentalis Lawr. Six specimens, both sexes, Barranca Puntarenas, August.

Rather to my astonishment the Western Sandpiper does not appear to have been taken in Costa Rica previously to Mr. Underwood's getting this series.

Limonites minutilla (Vieill.). Four specimens, both sexes, Barranca Puntarenas, and Pozo del Rio Grande, April and August.

PARRIDÆ.

Asarcia variabilis (Linn.). One adult male, Barranca Puntarenas, Aug. 14.

COLUMBIDÆ.

Columba speciosa Gmel. Eighteen specimens, adults and young of both sexes, Boruca and Paso Real, April-July.

Young birds, not full grown, lack the scaly markings of the adult plumage, being nearly uniform rusty brown above, with the underparts paler, grayer and whitish on middle of belly.

Columba rufina Temm. & Knip. Five adults, both sexes, Paso Real, Pozo del Rio Grande and Barranca Puntarenas, July and August.

Columba nigrirostris *Scl.* Four adults, both sexes, Boruca, Paso Real and Pozo del Rio Grande, May, July and August.

Chæmepella minuta (*Linn.*). Forty specimens, adults and young of both sexes, Paso Real, July.

Although recorded from southern Mexico and Guatemala, and again from Panama, this little dove has, so far as I know, not before been taken in Costa Rica.

Chæmepella rufipennis rufipennis (*Bonap.*). Twenty-three specimens, both sexes, young and adult, Boruca, Pozo del Rio Grande and Barranca, April-July.

Claravis pretiosa pretiosa *Ferrari-Perez.* Twenty-five specimens, both sexes, Boruca, Paso Real and Pozo del Rio Grande, April-August.

Leptotila verreauxi *Bonap.* Twenty-one specimens, adults and young, both sexes, Boruca, Paso Real, Pozo del Rio Grande and Barranca Puntarenas, April-August.

Leptotila rufinucha *Scl. & Salv.* Thirty-three specimens, adults and young of both sexes, Boruca and Pozo del Rio Grande, April, May and August.

Geotrygon montana (*Linn.*). Nineteen adults, both sexes, Boruca and Pozo del Rio Grande, April-June.

After very careful comparison of a large amount of material I can find no constant differences between birds of this species from the Greater Antilles and from the continent. Mainland specimens perhaps average a little darker in color, although many are indistinguishable from island skins in this respect; they also average just a trifle smaller, but not enough so to be appreciable in comparing single individuals.

PSITTACIDÆ.

Ara macao (*Linn.*). One adult female, Pozo del Rio Grande, April 20.

Brotogerys jugularis (*Müll.*). Thirteen specimens, both sexes, Paso Real, Pozo del Rio Grande and Barranca Puntarenas, July, April, and August.

Pionus senilis (*Spix*). Three specimens, both sexes, Paso Real, July.

CUCULIDÆ.

Coccyzus minor minor (*Gmel.*). One adult female, Pozo del Rio Grande, April 14.

Piaya cayana thermophila (*Scl.*). One adult male, Boruca, May 7.

Dromococcyx phasianellus (*Spix*). One female, Boruca, June 25.

PICIDÆ.

Melanerpes chrysauchen *Salv.* Twenty-two specimens, both sexes, Boruca, Paso Real and Pozo del Rio Grande, April-August.

Melanerpes wagleri *Salv. & Godm.* Twenty-two specimens, both sexes, Boruca, Paso Real and Pozo del Rio Grande, April-August.

Venilornis neglectus Bangs. Three adults, two males and a female, Pozo del Rio Grande, April.

Cherrie has already recorded one specimen of this species from Boruca under the name *Dendrobates ceciliæ* (Malh.); the bird was rare in the region visited by Underwood who saw but the three examples he took.

Campophilus guatemalensis buxans Bangs. Four specimens, both sexes, Boruca, Pozo del Rio Grande and Barranca Puntarenas, April, June and August.

Ceophlœus lineatus (Linn.). Five specimens, both sexes, Boruca, Paso Real and Pozo del Rio Grande, April, May and July.

Hargitt in 'Catalogue of Birds in the British Museum,' mentions that Costa Rican examples of this species examined by him differed slightly from typical specimens in being less distinctly barred below. Four of the five skins in the present series are very rusty below, possibly stained, and the black bars are rather indistinct, but the fifth does not differ in this respect from South American examples. All are rather smaller than typical examples; in point of size corresponding more nearly with *C. scapularis*, and suggesting that possibly the two forms actually intergrade in western Costa Rica.

Ceophlœus scapularis (Vig.). One adult female, Barranca Puntarenas, August.

This brings the ranges of the two forms very near to one another, and the Barranca specimen may be an intergrade; its bill is white but otherwise it does not differ from the Rio Grande examples of *C. lineatus*, being of the same size and having an equally black back.

Picumnus olivaceus flavotinctus Ridgw. Sixteen specimens, both sexes, Boruca, Paso Real and Pozo del Rio Grande, April–August.

RHAMPHASTIDÆ.

Rhamphastos tocard Vieill. Seventeen specimens, adults of both sexes and one young female, Boruca, Paso Real and Pozo del Rio Grande, April–August.

Pteroglossus frantzii Cab. Three adults, both sexes, Boruca and Pozo del Rio Grande, April and May.

GALBULIDÆ.

Galbula melanogenia Schl. Thirty-six specimens, adults and young of both sexes, Boruca, Paso Real and Pozo del Rio Grande, April–August.

Young individuals, about two thirds grown, with very short bills, are like the adults in color, and show the same sexual difference in the color of the throat, except that their upper parts are more coppery, less green.

BUCCONIDÆ.

Bucco dysoni Schl. Two adults, male and female, Paso Real, July 8.

Maecoptila panamensis panamensis Laf. Twenty-one specimens, young and adult of both sexes, Boruca, Paso Real, Pozo del Rio Grande and Lagato, April–August.

This species is dichromatic, there being a distinctly gray and a distinctly red-brown phase of plumage, having nothing to do with sex, age or season. In large series, as with most dichromatic birds, some skins intermediate between the two phases will always be found. I cannot see any differences between western Costa Rican skins and those from Panama, and if the subspecies *costaricensis* is a valid form these Rio Grande specimens do not represent it. One skin in my collection from Carrillo, the only one I have from eastern Costa Rica, appears to be quite typical *M. inornata* Du Bus, and I hardly think there is room for a subspecies *costaricensis*.

TROGONIDÆ.

Trogon atricollis tenellus (Cab.). Twenty-five specimens, adults and young of both sexes and one nestling male with wholly tawny back and breast and the belly slightly paler and somewhat mixed with whitish, Boruca and Pozo del Rio Grande, April-June.

Trogon bairdi Lawr. Nineteen specimens, both sexes, Boruca and Pozo del Rio Grande, April and May.

Trogon melanocephalus Gould. Six specimens, both sexes, Barranca Puntarenas, August.

Trogon caligatus caligatus Gould. Seventeen specimens, both sexes, Boruca, Barranca and Barranca Puntarenas, May, June and August.

Trogon massena Gould. Four adult males, Boruca and Pozo del Rio Grande, April, May and August.

MOMOTIDÆ.

Eumomota superciliaris australis Bangs. Four adults, both sexes, Barranca Puntarenas, August and January, 1905. Three of the four specimens were taken during a few days spent by Underwood at this place, in January, 1905, and are included here with the other collection. All are like the two original skins from Bebedero upon which I based the subspecies.

Momotus lessoni Less. Five specimens, adults of both sexes, and two young in nestling plumage, which is similar to the adult plumage except in lacking the bunch of black feathers on the chest, Boruca, Pozo del Rio Grande and Barranca Puntarenas, April, May and August.

ALCEDINIDÆ.

Ceryle torquata torquata (Linn.). Four adults, both sexes, Paso Real, Pozo del Rio Grande and Barranca Puntarenas, April, July and August.

Ceryle amazona (Lath.). One adult male, Pozo del Rio Grande, April.

Ceryle americana septentrionalis Sharpe. Nine specimens, both sexes, Boruca, Lagato and Pozo del Rio Grande, April-August.

ASTONIDÆ.

Pulsatrix perspicillata (Lath.). Two specimens, male and female, Pozo del Rio Grande, April.

CAPRIMULGIDÆ.

Nyctidromus albicollis (Gmel.). Three specimens, an adult male and two young in nestling plumage, Boruca, May and July.

MICROPODIDÆ.

Streptoprocne¹ zonaris zonaris (Shaw). Six adults, both sexes, Boruca, April and May.

TROCHILIDÆ.

Threnetes ruckeri (Bourc.). Fifteen specimens, adults of both sexes, and one not full grown young, Pozo del Rio Grande, April and August.

Glaucis hirsuta æneus (Lawr.). Three adults, two males and a female, Pozo del Rio Grande, August.

The form of *Glaucis hirsuta* that ranges from Costa Rica to Nicaragua, and that was named *Glaucis æneus* by Lawrence (Proc. Ac. Phil. 1867, p. 232), is a strongly marked subspecies, differing from true *G. hirsuta* of Panama and southward, in its smaller size, nearly wholly black bill, more bronzy back and much clearer and brighter cinnamomeous color of the underparts — all southern specimens being conspicuously dull and grayish cinnamon beneath.

Phaëthornis longirostris longirostris (Less. & Delatt.). Sixteen specimens, adults of both sexes, Pozo del Rio Grande and Boruca, April, June and August.

Phaëthornis guy coruscus Bangs. Two specimens, male and female, Pozo del Rio Grande, August.

Phaëthornis adolphi Gould. Fourteen adults, both sexes, Boruca, April-July.

Florisuga mellivora (Linn.). One adult male, Boruca, June 21.

Aphantochroa cuvieri (Delal. & Bourc.). Five adults, both sexes, Boruca, May and June.

Agyrtria decora (Salv.). Eighty-nine specimens, both sexes, Boruca, Paso Real, and Pozo del Rio Grande, April-August.

Saucerottea sophiæ (Bourc. & Muls.). Four adults, both sexes, Barranca Puntarenas, August.

Saucerottea niveoventer (Gould). One hundred and three specimens, both sexes, Boruca, May-July.

Amizilis tzacatl dubusi (Bourc. & Muls.). Fifty-one specimens, both sexes, Boruca, Barranca, and Boca Barranca Puntarenas, April-August.

Amizilis cinnamomea cinnamomea (Less.). One adult female, Barranca Puntarenas, August.

Hylocharis elicix (Bourc. & Muls.). One hundred and forty-one specimens, both sexes, Boruca, and Pozo del Rio Grande, May-August.

Chlorostilbon assimilis Lawr. Fourteen specimens, adults of both sexes, Boruca, May and June.

¹ See Oberholser, Proc. Biol. Soc. of Washington, Vol. XIX, pp. 67-70. May, 1906, for change of generic name of these swifts.

Thalurania columbica venusta (Gould). Forty-four adults, both sexes, Boruca, Barranca and Pozo del Rio Grande, May–August.

Elvira chionura (Gould). One adult female, Boruca, June 30.

This appears to be a rare bird in Costa Rica; though it has been before recorded from the Republic, I can find no exact localities; like other Panaman forms that extend into Costa Rica it probably reaches only to the Pacific slope.

Colibri delphinæ (Less.). One adult male, Boruca, May 21.

Heliotherix barroti (Bourc. & Muls.). One adult female, Paso Real, July 16.

Floricola superba (Shaw). Fifty specimens, both sexes, many young, Boruca, Paso Real, and Barranca, April–July.

On the whole Costa Rican skins of *Floricola superba* are nearer to true *superba* than to *pallidiceps*, though some are intermediate, between the two forms. The Costa Rican bird was named *sclateri* by Cab. & Heine, but nothing is gained by using this name for a purely intermediate race.

Clais guimeti (Bourc. & Muls.). Fourteen specimens, both sexes, Boruca, May and June.

Lophornis adorabilis Salv. Twelve specimens, both sexes, Boruca, May and June.

FORMICARIIDÆ.

Thamnophilus transandeanus Scl. Twenty-five specimens, adults of both sexes and two young males, Boruca, Pozo del Rio Grande, Lagato and Barranca Puntarenas, April–August.

Thamnophilus bridgesi Scl. One hundred and fifty-one specimens, adults and young of both sexes (the female being of course the so-called *Thamnophilus bridgesi* Scl. and the male the *T. punctatus* Cab.; as *bridgesi*, though based upon the female, is the older name it must stand for the species). Boruca, Paso Real, Pozo del Rio Grande and Lagato, April–August.

Thamnophilus doliatus (Linn.). Thirty specimens, both sexes, Boruca, Paso Real, Lagato and Barranca Puntarenas, April–August.

Myrmotherula ménétriesi (d'Orb.). Seventeen specimens, adults and young of both sexes, Boruca and Pozo del Rio Grande, April–July.

Formicivora boucardi Scl. Forty-four specimens, both sexes, Boruca, Paso Real, Pozo del Rio Grande, and Lagato, April–August.

Rhamphocænus rufiventris (Bonap.). Seventeen specimens, both sexes, Boruca, Paso Real and Pozo del Rio Grande, April–August.

Cercomacra tyrannina crepera (Bangs). One hundred and sixteen specimens, young and adult of both sexes, Boruca, Paso Real, Pozo del Rio Grande and Barranca, April–August.

Gymnopithys bicolor olivascens (Ridgw.). Nineteen specimens, both sexes, Boruca and Pozo del Rio Grande, April–June.

Myrmelastes exsul occidentalis (Cherrie). Seventy-four specimens, both sexes, young and adult, Boruca, Paso Real, Pozo del Rio Grande and Barranca, April–August.

***Gymnocichla nudiceps erratilis* subsp. nov.**

Ninety-two specimens, both sexes, young and adults, Boruca, Paso Real, Pozo del Rio Grande and Barranca, April-August.

Cotypes, from Boruca, Costa Rica, adult ♀, No. 18990, and adult ♂, No. 18991, coll. of E. A. and O. Bangs. Collected June 11, 1906, and May 22, 1906, respectively by C. F. Underwood.

Characters. Similar to true *G. nudiceps* of northern Colombia and Panama, but larger, wing and tail longer (in the adult ♂ of the new form averaging, wing, 78.5; tail, 62; in true *G. nudiceps* averaging wing, 76; tail, 58), bill and tarsus of about the same length in both forms. The adult male not different in color, from the adult ♂ of true *G. nudiceps*; the adult female, however, much more intensely ferruginous, the upper parts deeper and redder and without the olivaceous tinge seen in true *G. nudiceps*; the whole underparts deep, strong ferruginous, scarcely if any paler on belly, quite different in color from the orange-rufous underparts of true *G. nudiceps* which are also duller and paler in middle of belly; tail and wing, especially the edgings of lesser and middle coverts, much deeper ferruginous.

Measurements.

No.	Sex.	Locality.	Wing.	Tail.	Tarsus.	Culmen.
18991	♂ ad.	Boruca, C. R.	80	62	28	22
18992	♂ ad.	"	78	65	28.5	19
18993	♂ ad.	"	80	63	29	21.5
18994	♂ ad.	"	79	64	29	22
18995	♂ ad.	"	78	61	29	22
18996	♂ ad.	"	77.5	62	27.5	21.5
18997	♂ ad.	"	78.5	64	27	22
18998	♂ ad.	"	77	59	29	22
18999	♂ ad.	"	77	60	28.5	21
19000	♂ ad.	Pozo del Rio Grande, C. R.	79.5	61	28	22
18990	♀ ad.	Boruca, C. R.	75	58.5	28	21.5
19001	♀ ad.	"	74	57	26.5	20.5
19002	♀ ad.	"	75	58	27	19.5
19003	♀ ad.	"	75	58.5	28	21
19004	♀ ad.	"	76	58	28	21.5
19005	♀ ad.	"	74.5	59	27.5	21
19006	♀ ad.	"	73	56	26.5	22
19007	♀ ad.	"	76	56	28	21
19008	♀ ad.	"	75.5	55	27.5	21.5
19010	♀ ad.	Pozo del Rio Grande, C. R.	74.5	56.5	28	21

Remarks. Cherrie in the paper referred to in the introduction of this article recorded for the first time, I believe, the occurrence of *Gymnocichla nudiceps* in western Costa Rica. Underwood found the bird to be common

in the Rio Grande region and secured the large series listed above. I was much surprised, however, on comparing these skins with a series from Loma del Leon, Panama, taken some years ago by Brown, to find the Costa Rican form so different. The female of the Costa Rican bird can be told at a glance by its much deeper and more intensely ferruginous general coloration; the male, as might be expected in an almost wholly black bird, is not different in color, but can be distinguished by having a longer wing than true *G. nudiceps*, this difference being probably greater than the measurements indicate, because the Boruca series is in rather worn *summer* plumage, whereas the Panaman specimens, with which I compare them, are in fresh, unworn spring plumage.

Formicarius hoffmanni hoffmanni (Cab.). Eighty specimens, adults of both sexes, and one young female, Boruca, Paso Real, Pozo del Rio Grande, Lagato and Barranca, April–August.

A young female, in nestling plumage and not full grown, is similar to the adults in color, except in being duller with all the colors more blended, the chestnut patches on sides of neck and crissum less strongly marked, and the tail blackish only at tip.

One specimen has the whole throat white, marked with small black dots. I had already another skin just like it from Chiriqui, and Ridgway described a specimen, supposed to be a young male, of *F. nigriifrons* (Proc. U. S. Nat. Mus., Vol. XVI, p. 672, 1893) in similar plumage.

That these black spotted, white-throated birds do not represent the normal young plumage is proved by the presence in this series of the young female described above which has the throat just as in the adults. Moreover, my two specimens do not appear to be young — that is not nestlings — being so far as one can judge by the prepared skin, full grown and mature, and it remains to be found out just what stage of plumage these white-throated individuals, recorded now in two species of *Formicarius*, represent.

Grallaria lizanoi Cherrie. Twenty-four specimens, both sexes, Boruca, Paso Real, and Pozo del Rio Grande, April–August.

DENDROCOLAPTIDÆ.

Synallaxis albescens latitabunda subsp. nov.

Five specimens, both sexes, three adults and two young, Boruca, Paso Real and Barranca, May–July.

Type, from Boruca, Costa Rica, No. 19064, ♂ adult, coll. of E. A. and O. Bangs. Collected May 31, 1906, by C. F. Underwood.

Characters. Similar to *Synallaxis albescens albigularis* Sel. of north-eastern South America, but differing in having red of crown much more extended, reaching backward over entire occiput; the white throat more sharply defined, and gray band across chest more pronounced; the red-brown of wings and crown rather less ochraceous, more brickly.

Measurements.

No.	Sex.	Locality.	Wing.	Tail.	Culmen.
19064	♂ ad.	Boruca, Costa Rica	51	69.5	11.5
19062	♂ ad.	Paso Real, Costa Rica	53.5	69.5	11.5
19061	♀ ad.	Paso Real, Costa Rica	48	62.5	11

Remarks. Hellmayr has lately (Nov. Zool., XIII, p. 28, 1906) pointed out the differences between true *S. albescens* of southern South America and *S. albescens albigularis* and assigns to the latter form all specimens from eastern Ecuador, Colombia, Venezuela and the Orinoco region. Specimens from western Costa Rica, the extreme northern limit of the species, differ quite a little from those in my collection from Colombia, and must be considered, I think, to represent still another subspecies.

***Synallaxis pudica* Scl.** Twenty specimens, adults of both sexes and one young female, Boruca and Pozo del Rio Grande, April–August.

The young differs from the adults in lacking the rufous crown, the whole upper parts being brownish olive, and the underparts dull olive instead of gray.

***Automolus virgatus* (Lawr.).** Four adults, both sexes, Pozo del Rio Grande, April and August. This is of course the bird recorded by Cherrie as *A. pallidigularis*.

***Automolus exsertus* Bangs.** Fifty-three specimens, both sexes, Boruca Lagato and Pozo del Rio Grande, April–August.

***Xenops genibarbis mexicanus* Scl.** Forty-nine specimens, both sexes, Boruca, Paso Real, Pozo del Rio Grande and Lagato, April–August.

***Sclerurus guatemalensis* (Hartl.).** Four adults, both sexes, Boruca, Paso Real and Pozo del Rio Grande, April, May and July.

***Glyphorhynchus cuneatus* (Licht.).** One adult female, Pozo del Rio Grande, April 11.

***Dendrocichla anabatina anabatina* Scl.** Fourteen specimens, both sexes, Boruca, Paso Real and Pozo del Rio Grande, April–August.

***Dendroornis nana costaricensis* Ridgw.** Fifty-three specimens, both sexes, young and adult, Boruca, Paso Real, Pozo del Rio Grande, Barranca, Lagato, and Barranca Puntarenas, April–August.

***Dendroornis lachrymosa eximia* Hellmayr.** One adult male, Pozo del Rio Grande, April 12.

***Picolaptes compressus compressus* (Cab.).** Fourteen specimens, both sexes, Boruca, Paso Real, Pozo del Rio Grande, Barranca and Barranca Puntarenas, April–July.

***Dendrocolaptes sancti-thomæ hesperius* subsp. nov.**

Fourteen specimens, both sexes, Boruca, Paso Real, Pozo del Rio Grande and Lagato, April–August.

Type, from Lagato, Costa Rica, adult ♂, No. 19119, coll. of E. A. and O. Bangs. Collected May 27, 1906, by C. F. Underwood.

Characters. Similar to true *D. sancti-thomæ* (Lafr.), and of about the same size, but differing in color and markings as follows: head duller, more rusty, less yellowish or ochraceous; back less heavily marked with blackish cross bars; ground color of under parts slightly darker, more tawny, less ochraceous; the black bars on the feathers of under parts much narrower and more blended with the general color of the feathers, producing the effect of a fine and rather indistinct dusky cross-barring below. In true *D. sancti-thomæ*, the bars on the under surface are wide, black, and stand out in bold relief against the paler, yellower, ground color.

Measurements, adult ♂, *type*: Wing, 124; tail, 116; tarsus, 26.5; culmen, 40.5. Adult ♀, No. 19142, Boruca, Costa Rica, wing, 118; tail, 106; tarsus, 26.5; culmen, 39.

Remarks. This form — a fairly well marked subspecies of *D. sancti-thomæ* — appears to be confined to western Costa Rica. Specimens from eastern Costa Rica, — Juan Vinas and Cariblanco de Sarapiquí — being extreme examples of true *D. sancti-thomæ*, to which I also refer skins from Divala, Chiriquí, though these are not so extreme.

In all probability Lafresnaye's type of *Dendrocops sancti-thomæ* came from the town of Santo Tomás, near Orma, Honduras. It had been supposed by some ornithologists that Lafresnaye bestowed this name on his bird thinking it came from the island of St. Thomas in the West Indies (see Salvin and Godman, *Biol. Cent.-Am.*, Vol. II, p. 192). Skins from Honduras are similar in all respects to those from eastern Costa Rica.

TYRANNIDÆ.

Placostomus superciliaris (Lawr.). Nineteen specimens, both sexes, Boruca, Pozo del Rio Grande and Paso Real, April–August.

Rhynchocyclus brevirostris (Cab.). Six adults, both sexes, Boruca and Pozo del Rio Grande, April–June.

Rhynchocyclus cinereiceps (Scl.). Eighteen specimens, adults of both sexes and one young male, Boruca, Paso Real and Pozo del Rio Grande, April–July.

Todirostrum cinereum finitimum Bangs. Two specimens, male and female, Pozo del Rio Grande, August.

Todirostrum schistaceiceps Scl. Thirty-two specimens, adults and young of both sexes, Boruca, Paso Real and Pozo del Rio Grande, April–August.

Oncostoma cinereigulare (Scl.). Thirteen specimens, both sexes, Boruca and Pozo del Rio Grande, April–August.

Pipromorpha assimilis dyscola (Bangs). Seventy-one specimens, adults and young of both sexes, Boruca, Paso Real, Pozo del Rio Grande, and Barranca, April–August.

Leptopogon pileatus faustus subsp. nov.

Five adults, both sexes, Boruca and Paso Real, May and July.

Type, from Boruca, Costa Rica, adult ♂, No. 17828, coll. of E. A. & O. Bangs. Collected May 5, 1906, by C. F. Underwood.

Characters. Similar to true *Leptopogon pileatus* Cabanis of Guatemala and southern Mexico, and of about the same size, but back paler green; under parts much paler, especially the belly which is primrose yellow; lining of wing and wing bands paler and much yellower, less fulvous; margins of rectrices and upper tail-coverts much greener, less reddish olive.

The new form is much nearer to *C. superciliaris* than true *C. pileatus* in general coloration, except for the brown instead of gray cap.

Measurements.

No.	Sex.	Locality.	Wing.	Tail.	Tarsus.	Culmen.
17828	♂ ad.	Boruca, C. R.	67	56.5	15	12.5
17830	♂ ad.	Paso Real, C. R.	64	51	14.5	12.5
17832	♂ ad.	"	65	56	14	13
17831	♀ ad.	"	59	45	14	13
17829	♀ ad.	Boruca, C. R.	59	48	13.5	13

Remarks. *C. pileatus faustus* is a well marked southern form of which the five skins before me vary but little in color among themselves, all differing from northern specimens in their paler colors and light yellow bellies.

The type locality of the species is Guatemala; one skin in my collection from that country (Gualan, Guatemala) agrees much better with examples from Vera Cruz, Mexico, than with the Costa Rican series. It, however, approaches slightly the southern form in some respects, and I judge the extreme characters of the northern form are only attained in the very northern part of its range — southern Mexico.

Myiopagis placens accola Bangs. Three adults, one male, two females, Boruca, April, May and June.

Camptostoma pusilla flaviventre (Scl. & Salv.). Two adults, male and female, Paso Real and Pozo del Rio Grande, July and August.

Tyranniscus parvus Lawr. Forty-three specimens, young and adults of both sexes, Boruca, Paso Real and Pozo del Rio Grande, April–August.

Elainea flavogastra subpagana (Scl. & Salv.). Twenty-six specimens, adults and young of both sexes, Boruca, Paso Real and Lagato, April–July.

Elainea chiriquensis Lawr. Twelve specimens, adults and young of both sexes, Boruca, Paso Real and Lagato, April–July.

This appears to be the first time this species has been recorded from Costa Rica, though the type came from near by in Chiriqui.

Mr. Ridgway has kindly informed me that the species must be known by Lawrence's name though both Selater and Allen synonymize *E. chiriquensis* with *E. flavogastra subpagana*; they however, were clearly wrong.

Lawrence's type, in the U. S. National Museum, agrees entirely with the present Costa Rican series and also with Panama birds, upon which I based my *Elainea sordidata* (the type of the latter was from the Pearl

Islands, but specimens from Panama, Chiriqui and Costa Rica prove to be the same).

Elainia chiriquensis Lawrence is an earlier name for the species than *Elainia albivertex* Pelz.; whether or not the latter can be maintained as a southern subspecies I am not now prepared to say.

Legatus albigollis (Vicill.). Four specimens, three males and a female, Boruca, April-June.

Myiozetetes similis superciliosus (Bonap.). Two specimens, male and female, Boruca, June and July.

Pitangus derbianus derbianus (Kaup). One adult female, Puntarenas, Aug. 25.

Myiodynastes luteiventris Bonap. One adult female, Puntarenas, August.

Myiodynastes audax nobilis (Scl.). One adult male, Boruca, May 15.

Onychorhynchus mexicanus fraterculus Bangs. Eleven specimens, adults of both sexes and one young female, Boruca, Paso Real and Pozo del Rio Grande, April, May and July.

The young female, about half grown, taken April 29, is similar in color to the adults except that the throat and breast are thickly marked with small black spots and the back mottled with dusky and yellowish.

Myiobius barbatus atricauda Lawr. Seventeen adults, both sexes, Boruca and Pozo del Rio Grande, April-August.

Myiobius xanthopygus sulphureipygius (Scl.). Thirty-two specimens, adults of both sexes and young, Boruca, Paso Real and Pozo del Rio Grande, April-August.

Terenotriccus fulvicularis (Salv. & Godm.). Thirteen specimens, both sexes, Boruca, Paso Real and Pozo del Rio Grande, April-August.

Empidonax traillii traillii (Aud.). Two males, Boruca, April 28, and Pozo del Rio Grande, Aug. 15.

Empidonax traillii alnorum Brewster. Three females, Boruca, April 27, May 8 and May 15.

Empidonax flaviventris (Baird). Seven specimens, both sexes, Boruca and Pozo del Rio Grande, April 9-May 9.

Horizopus richardsonii sordidulus (Scl.). Five adults, both sexes, Boruca, May.

Myiarchus nuttingi nuttingi Ridgw. One adult male, Barranca Puntarenas, Aug. 15.

Myiarchus lawrencei bangsi Nelson. Nine adults, both sexes, Boruca, Pozo del Rio Grande and Lagato, April, May, June and August.

Although these skins vary somewhat among themselves in the amount of rufous edging to the tail and wing feathers, all are distinctly referable to *M. lawrencei bangsi* differing from *M. lawrencei nigricapillus* in their intensely black heads, greener backs and smaller bills.

Tyrannus tyrannus tyrannus (Linn.). One adult male, Pozo del Rio Grande, April 11.

Tyrannus melancholicus satrapa (Licht.). Two adult males, Boruca, April 30, and July 9.

Muscivora tyrannus (Linn.). One male, Paso Real, July 22.

PIPRIDÆ.

Pipra mentalis ignifera *Bangs*. Fifty-four specimens, adults of both sexes and young, Boruca, Paso Real and Pozo del Rio Grande, April-August.

Pipra vetulina *Berlepsch*. Forty-five specimens, both sexes, Boruca, Paso Real and Pozo del Rio Grande, April-August.

Coropipo leucorrohoa altera *Hellmayr*. Eleven specimens, both sexes, Boruca and Paso Real, April-July.

Chiroxiphia linearis (*Bonap.*). Two specimens, male and female, Paso Real and Barranca Puntarenas, July and August.

Manacus aurantiacus *Salvin*. One hundred and seven specimens, adults of both sexes and young, Boruca, Pozo del Rio Grande, Paso Real and Lagato, April-August.

Scotothorus verapacis dumicola *Bangs*. Three specimens, both sexes, Pozo del Rio Grande, April.

COTINGIDÆ.

Tityra semifasciata costaricensis *Ridgway*. Nine adults, both sexes, Boruca, and Barranca Puntarenas, April, May, June and August.

Tityra albitorques fraserii (*Kaup*). Five specimens, adult male and female and three young, Paso Real, July 20-22. The young are in nestling plumage and have the back and wings much suffused with yellowish brown, the whole side and top of the head reddish brown, spotted with blackish on the occiput.

Pachyrhampus cinereiventris *Scl.* Six adults, both sexes, Boruca, Barranca Puntarenas, Paso Real and Pozo del Rio Grande, May, July and August.

Lathria unirufa clara *Ridgw.* Two adults, male and female, Pozo del Rio Grande, April 5 and 17.

Attila citreopygia citreopygia (*Bonap.*). Four adults, both sexes, Boruca and Pozo del Rio Grande, April and May.

Attila citreopygia luteola *Ridgw.* One adult male, Pozo del Rio Grande, April 15.

Mr. Ridgway kindly identified these five skins of *Attila* and decided that four of them were referable to true *citreopygia* and one to *luteola*, from which it seems reasonable to infer that the Rio Grande region of Costa Rica is the meeting ground of these two races.

Microtriccus semiflavus semiflavus (*Scl. & Salv.*).¹ One adult male, Boruca, May 4, 1906.

Chasmorhynchus tricarunculatus *J. & E. Verr.* One female, Pozo del Rio Grande, April.

¹ See Ridgway, Proc. Biol. Soc. of Washington, Vol. XVIII, p. 210, Sept. 2, 1905.

TURDIDÆ.

Planesticus grayi casius (Bonap.). Six specimens, one adult male and five young, Boruca, April and May.

Planesticus tristis cnephosa (Bangs). Forty-four specimens, adults and young of both sexes, Boruca, April-July.

Hylocichla ustulata swainsonii (Cab.). Three specimens, Boruca, and Pozo del Rio Grande, April 21 and 30, and May 3.

Catharus griseiceps Salvin. Twenty-two specimens, adults and young of both sexes, Boruca, Paso Real, and Barranca, April-July.

These skins average slightly different from specimens from Chiriqui, being a little paler — whiter — on throat, with the tail and upper tail coverts slightly redder, and the under tail coverts more fulvous. The differences, however, are slight and not altogether constant, and as the Costa Rica specimens were taken in spring and summer and the Chiriqui birds, with which I have compared them, in winter, the slight color differences noted may be seasonal.

The species is new to the ornithology of Costa Rica.

Catharus melpomene costaricensis Hellmayr. Two young, male and female in nestling plumage, Boruca, July 8 and Barranca, June 28. No adults of this species were taken, but the young are easily recognized, and quite different from the corresponding plumage of *Catharus griseiceps*. These two specimens were identified by Mr. Ridgway.

SYLVIIDÆ.

Polioptila superciliaris superciliaris Lawr. Thirty-one specimens, adults and young of both sexes, Boruca, Paso Real, Pozo del Rio Grande and Barranca, April-August.

TROGLODYTIDÆ.

Heleodytes capistratus capistratus (Lesson). One adult male, Barranca, August 13.

Pheugopedius fasciato-ventris melanogaster (Sharpe). Sixty-eight specimens, adults and young of both sexes, Boruca, Pozo del Rio Grande and Barranca, April-August.

Pheugopedius hyperythrus (Salv. & Godm.). Fifty-six specimens, adults and young of both sexes, Boruca and Paso Real, April-July.

These are slightly darker and richer tawny below than Panaman examples.

Troglodytes musculus inquietus (Baird). Two males, one adult May 17, the other young June 19, Boruca.

The taking of these two specimens positively extends the range of this form to western Costa Rica. I wholly agree with Mr. Ridgway's opinion expressed on page 571, footnote, of 'Birds of North and Middle America,' Part III, that *T. intermedius* is specifically distinct from *T. inquietus*. I have never seen any indication of intergradation among the many specimens I have examined.

Henicorhina prosthaleuca pittieri (Cherrie). Seventeen specimens, adults and young of both sexes, Boruca, May–July.

Thryophilus semibadius (Salv.). Nineteen specimens, adults and young of both sexes, Boruca, Paso Real, Pozo del Rio Grande and Lagato, April–July.

Thryophilus pleurostictus ravus Ridgw. Four specimens, two adult males and a young male and young female, Barranca Puntarenas, August.

Thryophilus rufalbus castanonotus Ridgw. Fifteen specimens, adults and young of both sexes, Boruca, Paso Real and Lagato, May and July.

Thryophilus modestus modestus (Cabanis). Twenty-two specimens, adults and young of both sexes, Boruca, Paso Real, and Pozo del Rio Grande, April–August.

Skins from the Rio Grande region of Costa Rica are not extreme *T. modestus*, but are intergrades between that form and *T. modestus elutus*; on the whole, however, I think them rather nearer to *modestus* than to *elutus*.

VIREONIDÆ.

Vireosylva flavoviridis flavoviridis Cassin. Nineteen specimens, adults of both sexes and two young, Boruca, Paso Real, and Barranca, April–July.

Vireosylva philadelphica Cassin. One female, Boruca, May.

Pachysylva decurtata (Bonap.). Twenty-four specimens, adult and young of both sexes, Boruca and Pozo del Rio Grande, May–August.

This series does not average any smaller than specimens in my collection from Vera Cruz, Mexico, neither can I detect any constant differences in coloration, and I am inclined to believe the southern subspecies *pusillus* of Lawrence cannot be maintained, although Ridgway, ‘Birds of North and Middle America,’ Part III, page 217, footnote, seemed rather to think it might.

Pachysylva ochraceiceps pallidipectus Ridgw. Thirty specimens, adults and young of both sexes, Boruca, Paso Real, Lagato, Barranca and Pozo del Rio Grande, April–August.

Young in nestling plumage are very different in color from adults, having the entire upper parts dark cinnamon, and the under parts, except under tail coverts which are greenish yellow, pale cinnamon mixed with whitish — the throat mostly whitish. From this plumage they moult into the livery of the adult; three skins in the above series being in process of such a change.

Pachysylva viridiflava (Lawr.). One adult male, Boruca, June 16.

HIRUNDINIDÆ.

Progne chalybea chalybea (Gmel.). Seven specimens, adults and young of both sexes, Boruca and Paso Real, May and July.

Stelgidopteryx ruficollis uropygialis (Lawr.). One adult female, Pozo del Rio Grande, April 4, 1906.

Iridoprocne albilineata (Lawr.). Eight specimens, adults and young of both sexes, Barranca Puntarenas, August.

Pygochelidon cyanoleuca (Vieill.). Sixteen specimens, adults and young of both sexes, Boruca, Paso Real and Barranca, May-July.

MNIOTILTIDÆ.

Chrysocantor æstiva æstiva (Gmel.). Four specimens, two males, two females, Boruca and Pozo del Rio Grande, April 10 to April 27.

Dendroica pensylvanica (Linn.). Two males, Pozo del Rio Grande, April 6 and April 9.

Oporornis formosa (Wilson). Two males, Pozo del Rio Grande, April 4 and April 17.

Oporornis philadelphia (Wilson). Three specimens, two males and a female, Boruca and Pozo del Rio Grande, April 11 to April 27.

Seiurus aurocapillus (Linn.). Four specimens, both sexes, Boruca and Pozo del Rio Grande, April 12 to May 6.

Seiurus noveboracensis noveboracensis (Gmel.). One male, Pozo del Rio Grande, April 8.

Chamæthlypis caninucha Ridgway. Eighteen specimens, adults and young of both sexes, Boruca, Paso Real and Barranca, May-July.

Young in nestling plumage, besides lacking all gray and black markings on the head, differ from the adults in the color of the under parts which are dull olive-yellow.

Icteria virens virens (Linn.). One female, Pozo del Rio Grande, April 9.

Basileuterus rufifrons delatarii (Bonap.). Seven adults, both sexes, Boruca and Paso Real, April, May and July.

Basileuterus semicervinus veraguensis (Sharpe). Eleven specimens, adults of both sexes and one nestling female, Boruca and Paso Real, April, May and July.

This series presents much variation, and some skins are very close to *B. semicervinus leucopygius* (Scl. & Salv.) if not really referable to that form, while others are typical *B. s. veraguensis*.

Rhodinocichla rosea eximia Ridgw. Thirty-three specimens, adults of both sexes, immature of both sexes and two nestlings, both male. Boruca, April-July.

CEREBIDÆ.

Chlorophanes spiza exsul Berlepsch. Ninety-one specimens, adults and young of both sexes, Boruca and Paso Real, April-July.

This series is, like Chiriqui specimens, wholly referable to *C. spiza exsul*, which in my opinion is an excellent form. The very short bill of *exsul*, which in the adult male averages about 15 mm., at once distinguishes it from the northern *guatemalensis* with a bill of 17.5 mm.

Cyanerpes cyaneus (Linn.). Sixty-nine specimens, adults and young of both sexes, Boruca, Paso Real and Lagato, April-July.

Cyanerpes lucidus isthmicus subsp. nov.

Five specimens, four adult males, one adult ♀ (?), Boruca and Paso Real, July.

Type, from Paso Real, Costa Rica, adult ♂, No. 18325, coll. of E. A. and O. Bangs. Collected July 22, 1906, by C. F. Underwood.

Characters. Similar to true *C. lucidus* of Guatemala, but smaller with shorter and much more slender bill; the adult male with the blue color of the body darker (in true *C. lucida* body and head are of about the same shade, in the new form the body is darker than the head, the latter being of the same light blue color as in true *C. lucida*); adult female rather duller green on the back, and with the head less washed with bluish.

Measurements.

No.	Sex.	Locality.	Wing.	Tail.	Culmen.
18324 ¹	♂ ad.	Paso Real, C. R.	54	25	19
18325	♂ ad.	"	54	25.5	18.5
18326	♂ ad.	"	56.5	27	17.5
18327	♂ ad.	"	55	27	18
17292	♂ ad.	Pozo Azul, C. R.	55	26	17.5
17293	♂ ad.	"	55.5	27	16.5
17294	♂ ad.	"	55	25	17
18317	♂ ad.	"	57	28	16.5
18320	♂ ad.	"	56	25	16
40319 ²	♂ ad.	Panama, Pan.	56	28	17
32010	♂ ad.	Panama, line of R. R.	52	24.5	16.5
128418	♂ ad.	Escondido R., Nic.	56	26	17
17290 ¹	♀ ad.	Pozo Azul, C. R.	54	26	17
18315	♀ ad.	"	53	26.5	16

For comparison with these a series of true *Cyanerpes lucidus* affords the following:

Measurements.

No.	Sex.	Locality.	Wing.	Tail.	Culmen.
20407 ²	♂ ad.	Choctum, Guat.	60	31	19.5
60037	♂ ad.	Guatemala	60.5	30	19.5
147809	♂ ad.	"	61	32	18.5
147810	♂ ad.	"	59	32	19
10149 ¹	♂ ad.	Ceiba, Hond.	60	29.5	20.5
10150	♂ ad.	"	59.5	30	20
10151	♂ ad.	"	61.5	32.5	20
10153	♂ ad.	"	62	32	19.5
10155	♂ ad.	"	59	31.5	19
10156	♂ ad.	"	59.5	29.5	20
10157	♂ ad.	"	61	30	20
10158	♂ ad.	"	57.5	28	19
10159	♂ ad.	"	60	31	19
10160	♂ ad.	"	60	32.5	19

¹ Coll. of E. A. and O. Bangs.

² Coll. of U. S. National Museum.

Remarks. The two geographical races into which *Cyanerpes lucidus* divides are easily separated by the measurements, as given above; the color differences are not altogether constant, though they show very well in series.

True *Cyanerpes lucidus*, originally described from Guatemala by Sclater and Salvin, I should restrict to Guatemala, Honduras and Salvador and call all specimens from Nicaragua, Costa Rica and Panama *Cyanerpes lucidus isthmicus*. Specimens from eastern Costa Rica and from Nicaragua show some signs of being intermediate, but still, on the whole, go better with the more southern race than with true *C. lucidus*.

The distribution of these two races of *C. lucidus* conforms to that of many species of birds that occupy the same area in Central America and points to a general faunal division, the exact lines of which vary a little, separating the biota of northern and southern Central America.

Dacnis cayana callaina *Bangs*. Nine specimens, adults of both sexes and young males, Boruca and Paso Real, May and July.

Dacnis venusta *Laur.* Five males, four adult, one young, Boruca, May and June.

Cœreba mexicana (*Sclater*). Thirty-six adults, both sexes, Boruca, Barranca, and Pozo del Rio Grande, April–August.

ICTERIDÆ.

Cacicus microrhynchus (*Scl. & Salv.*). Four adults, both sexes, Pozo del Rio Grande and Lagato, April and May.

Amblycercus holosericeus (*Licht.*). Thirty-seven specimens, both sexes, Boruca and Pozo del Rio Grande, April–August.

Icterus spurius (*Linn.*). One adult male, Pozo del Rio Grande, August 10.

TANAGRIDÆ.

Euphonia gracilis (*Cabanis*). Nine specimens, adults of both sexes and young, Boruca, Paso Real, Barranca and Pozo del Rio Grande, June–August.

Euphonia luteicapilla (*Cabanis*). Twenty-eight specimens, adults of both sexes and young, Boruca, and Paso Real, April–July.

Euphonia minuta humilis (*Cabanis*). Two males, neither quite adult, Boruca, May.

Euphonia crassirostris *Sclater*. Three males, none of them fully adult, May and July.

Calospiza guttata chrysophrys (*Scl.*). Four specimens, adults of both sexes and one young male, Boruca and Barranca, June.

Calospiza gyroloides (*Lafr.*). Thirty-eight specimens, adults and young of both sexes, Boruca and Barranca, April–June.

Calospiza larvata fanny (*Lafr.*). Forty specimens, adults and young of both sexes, Boruca and Paso Real, April–July.

Tanagra cana Swains. Three specimens, an adult male and two young females, Boruca, May.

Piranga testacea testacea Scl. & Salv. Two adult males, Boruca and Paso Real, June and July.

Ramphocelus costaricensis Cherrie. Two hundred and nine specimens, adults and young of both sexes, Boruca, Paso Real and Pozo del Río Grande, April–August.

Lanio melanopygius Salv. & Godm. Eight adults, both sexes, Boruca and Pozo del Río Grande, April and May.

Tachyphonus nitidissimus Salv. Twenty-seven specimens, adults of both sexes and young males, two in nestling plumage, Boruca, Paso Real, Barranca and Pozo del Río Grande, April–July. The color of the crown-patch in the adult males varies much — from gamboge yellow to almost ochraceous-rufus, sometimes being yellow in middle and ochraceous at the end or sides.

Eucometis spodocephala stictothorax (Berlepsch). Thirty-seven specimens, adults and young, Boruca, Paso Real, Pozo del Río Grande and Lagato, April–August.

This series clearly is referable to *E. spodocephala stictothorax* and not to true *E. spodocephala* although some individuals approach the latter form and perhaps indicate intergradation somewhere in this vicinity; others — in fact most of the series — are extreme instances of the more southern subspecies. Specimens from Pozo Azul, Costa Rica, I should also refer to *stictothorax*, while examples from Volcan Miravalles are extreme *spodocephala*.

Young specimens in nestling plumage have the whole head and throat olive-green like the back, and the chest streaked with this color, otherwise they are similar to the adults.

Phœnicothraupis rubica vinacea (Lawr.). Sixty-two specimens, adults and young, Boruca and Lagato, April–June.

Nestlings are much browner, less greenish than the adult female and lack the yellow crown patch.

FRINGILLIDÆ.

Spiza americana (Gmel.). Five adults, both sexes, Pozo del Río Grande, April 3 to April 12.

Emberizoides sphenura hypochondriacus (Hellmayr).¹ Seven adults, both sexes, Boruca and Barranca, May and June.

This strongly characterized subspecies, lately described by Hellmayr, is of course a new bird to Costa Rica. It was very surprising after all the

¹ *Emberizoides macrourus hypochondriacus* Hellmayr, Bull. Br. Orn. Club, Vol. XIX, Dec. 31, 1906, p. 28. Type locality, Frances, Volcan de Chiriqui, 2000 ft. alt.

Dr. Chas. W. Richmond has called my attention to the fact that *Fringilla macroura* Gmel. 1788, is preoccupied by Pallas in Vroeg's Catalogue 1764, and that therefore the wide ranging South American species must be known by Vieillot's name *Passerina sphenura*, N. Dict. d'Hist. Nat., XXV, p. 25, 1817, Type locality, Cayenne.

bird collecting that has been done in Panama, Chiriquí and Costa Rica to find a bird of this genus inhabiting Central America, and still more so that it should have been taken by two collectors in two different regions so nearly at the same time.

At Boruca and Barranca Mr. Underwood did not find the bird living in marshes as *Emberizoides sphenura* is said to do in South America, but inhabiting small patches of a low green shrub in open places in and near the forest. It kept concealed in these low bushes, was very hard to flush, and had to be shot upon the wing as it darted from one clump to another, and I fancy it is a bird that might easily be overlooked by collectors.

Arremonops superciliosus superciliosus (*Salvin*). One adult female, Boca Barranca Puntarenas, Aug. 14.

Arremonops conirostris richmondi *Ridgw.* Thirty specimens, adults and young, Boruca, Barranca, Lagato and Pozo del Rio Grande, April-August.

Arremon aurantirostris *Lafr.* Eighty-eight specimens, adults and young, Boruca, Paso Real, Barranca, Lagato and Pozo del Rio Grande, April-August.

Buarremon costaricensis sp. nov.

Fifty-two specimens, adults of both sexes and one young female in nestling plumage, Boruca, Barranca and Lagato, April-July.

Type, from Boruca, Costa Rica, adult ♂, No. 18606, coll. of E. A. and O. Bangs. Collected July 1, 1906, by C. F. Underwood.

Characters. Somewhat similar to *B. assimilis* (Boissoneau), to which species it has usually been referred, of South America — Colombia and Venezuela to Peru — but larger; with larger, both longer and stouter, bill; and shorter and apparently (judged from dried specimens) heavier tarsus; color of back, etc., much clearer olive-green, less reddish olive; flanks and under tail coverts greener, less brownish; gray parts of head and sides of neck paler, clearer gray; bend of wing brighter, clearer yellow; nearly, usually entirely, lacking the whitish spot on forehead above middle of base of culmen so conspicuous in *B. assimilis*.

Measurements.

No.	Sex.	Locality.	Wing.	Tail.	Tarsus.	Culmen.
18606	♂ ad.	Boruca, C. R.	84	76	28	18
18596	♂ ad.	"	85	78	27.5	18.5
18597	♂ ad.	"	85.5	79	27	18
18609	♂ ad.	"	82	72	26.5	17
18607	♂ ad.	"	85	77	27.5	19
18601	♂ ad.	Lagato, C. R.	80	78	28	17.5
18592	♀ ad.	Boruca, C. R.	78	76	28	17
18599	♀ ad.	"	80	74	27	17.5
18600	♀ ad.	"	79	74	26	17
18605	♀ ad.	"	81	75	26.5	17.5
18608	♀ ad.	"	78	75	26	17
18611	♀ ad.	"	80	72	26.5	17

Three "Bogota" skins of *Buarremon assimilis* measure respectively as follows: wing, 79, 78, and 79.5; tail, 78, 75 and 78; tarsus, 30, 30 and 30; culmen, 16, 16 and 15.5.

Remarks. Lawrence, in 1868, very doubtfully referred to *Buarremon assimilis* a specimen from Guatila, Costa Rica, he then had in hand, pointing out differences between it and South American examples; Salvin, however, afterward examining the same skin, came to the conclusion it did not differ at all from South American examples.

The large series taken by Underwood shows very pronounced and constant differences from *B. assimilis* of Colombia and southward, and as no bird of this sort has ever been taken in Chiriqui or Panama, I am inclined to accord the Costa Rican *Buarremon* full specific rank.

Though wholly wanting or exceedingly rare in other parts of Costa Rica, Underwood found *Buarremon costaricensis* an abundant bird in the Rio Grande region.

Volatinia jacarini splendens (Vieill.). Thirteen specimens, both sexes, Boruca and Paso Real, May–July.

Sporophila gutturalis (Licht.). One adult male, Pozo del Rio Grande, April 18.

This is a new bird to Costa Rica, and I believe has before been taken on the continent no farther north than on the line of the Panama Railroad.

Sporophila aurita (Bonap.). Thirty-eight specimens, adults of both sexes and young males, Boruca, Paso Real, Barranca and Pozo del Rio Grande, April–August.

The adult males from this series — twenty-one in number — show, for this species, remarkably little individual variation, there being no very black ones and none with white throats. All have black throats and breasts, white rumps and bellies and a semicircle of white on each side of the neck, are practically all alike, and represent the phase of plumage named by Lawrence *S. semicollaris*, except that the rump is slightly more extensively white.

Sporophila morelleti morelleti (Bonap.). Four specimens, two adult males, one young male and one young female, Pozo del Rio Grande, April and August.

Amaurospiza concolor Cabanis. One adult male of this rare species, Boruca, June 16, 1906.

Cyanocompsa concreta cyanescens Ridgw. Forty-nine specimens, both sexes, Boruca, Paso Real and Pozo del Rio Grande, April–August.

Oryzoborus funereus Sclater. Four adults, both sexes, Boruca and Barranca, June.

Saltator magnoides intermedius (Lawr.). Eighteen specimens, adults of both sexes and one young in nestling plumage, Boruca, Barranca, Pozo del Rio Grande and Barranca Puntarenas, April–August.

These skins represent *S. magnoides intermedius*, differing in no way from specimens from Panama, except that in the series there is not an example with the black band across the chest broken or wanting; the

band, however, is very narrow, and many Panaman examples are precisely like these Rio Grande specimens.

The bird of eastern Costa Rica is *S. magnoides medianus* Ridgw.; not usually so extreme as more northern specimens, but clearly to be referred to that form.

***Saltator striatipectus isthmicus* (Sclater).** Forty-six specimens, both sexes, Boruca and Lagato, April-July.

ANOTHER HYBRID HUMMINGBIRD — *SELASPHORUS*
RUFUS + *ATTHIS CALLIOPE* — FROM
CALIFORNIA.

BY JOHN E. THAYER AND OUTRAM BANGS.

SHORTLY after the death of Walter E. Bryant his collection of beautifully mounted Californian Hummingbirds came into the possession of Thayer and is now in the Thayer Museum at Lancaster, Mass. In this collection we found, while identifying the species, a remarkable hybrid apparently of *Selasphorus rufus* and *Atthis calliope*. It was shot at Oakland, California, May 8, 1896, while feeding on locust blossoms.

In color this example, which is a fully adult male, is somewhat intermediate between adult males of the two species of which it is probably a hybrid.

The back is green, duller and more coppery than in *Atthis calliope*, the upper tail coverts and rectrices are edged with rufous, the rufous edging reaching nearly to the tips of the feathers on the inner webs of the rectrices and about to the middle on the outer webs; the cheeks, sides of body and under tail coverts are all clouded with rufous; the gorget, composed of feathers more pointed and narrower than in *Selasphorus rufus*, with the white bases showing slightly through, is of the most gorgeous ruby red, different from that of either *Selasphorus rufus* or *Atthis calliope*; the shape of the rectrices corresponds rather better with male examples of *Selasphorus rufus*, the outer rectrices being narrower and pointed, but the tail is short and more nearly square as in *Atthis calliope*.

The original label bore an inscription to the effect that the specimen was to be recorded in 'The Auk' by R. C. McGregor, the volume and page not, however, filled out. Turning to the volumes of 'The Auk' we find on page 91, Vol. XIV, 1897, a note by R. C. McGregor entitled "Broad-tailed Hummingbird in California." Here the author mentions an adult male which he identified as *Selasphorus platycercus* taken at Oakland, May 8, 1890, and in the mounted collection of Walter E. Bryant. This is probably the bird we have before us now, because there certainly was not a specimen of *Selasphorus platycercus* in Mr. Bryant's mounted collection from Oakland, and we believe McGregor made an error in the date, giving "1890" for 1896.

Mr. Robert Ridgway has very kindly examined the specimen with much care and agrees with us as to its hybrid character and probable parentage.

All students of the Trochilidæ well know how prone these birds are to hybridize, and from California alone four different hybrids are now recorded:

Selasphorus floresii = *Selasphorus alleni* + *Calypte anna*; *Trochilus violajugulum* = *Trochilus alexandri* + *Calypte anna*; *Trochilus alexandri* + *Calypte costæ* (not named); and *Selasphorus rufus* + *Atthis calliope* (not named), the subject of the present note.

LIST OF THE BIRDS OF LOUISIANA.

BY GEO. E. BEYER, ANDREW ALLISON, AND HENRY H. KOPMAN.

PART III.¹

1. HORNED GREBE (*Colymbus auritus*). A regular winter visitor, not at all uncommon from November until the end of March. It is usually found in flocks of from five to ten individuals, especially on the lagoons and wide bayous of the southern section of the State. It is not at all shy, but rather inquisitive, often swimming quite up to the hunter's duck blinds. It does not seem to associate with water birds of other species.

2. PIED-BILLED GREBE (*Podilymbus podiceps*). Resident; numbers greatly increase during winter, when one or two may be seen in almost every water hole in suitable localities. As a migrant, it arrives in the lower parts of the State about the end of October, while its numbers are greatly diminished about the middle of March.

3. LOON (*Gavia imber*). A common winter resident on the Gulf waters; fairly common also on the larger bodies of water far inland. The usual time of arrival is the latter part of October, though it has been observed on Bay St. Louis, Miss., August 11, 1900, and in the same locality during September, 1896. The last are seen about the middle of April. (One was seen at Biloxi, Miss., April 22, 1906.)

4. HERRING GULL (*Larus argentatus*). Very common from late fall to early spring, and present from about October 15 to April 15. It is found chiefly along the coast and on the lakes of the southern section. It is common on the Mississippi at New Orleans, as are the Ring-billed and Laughing Gulls. This species and the Ring-billed Gull are especially common about oyster canneries, as at Timbalier Bay.

5. RING-BILLED GULL (*Larus delawarensis*). Common in practically the same localities and at the same seasons as the preceding.

6. LAUGHING GULL (*Larus atricilla*). Though it appears to be restricted as a breeder to the islands along the coast, it ranges over a large part of the State at nearly all seasons, usually following the courses of the rivers. It is rarely if ever observed on the Mississippi at New Orleans during summer, though it may be seen at that season on Lake Pontchartrain, five miles away. There are no nesting colonies on the shores of Lake Pontchartrain, however.

7. FRANKLIN'S GULL (*Larus franklinii*). A fairly regular, but never common, winter visitor on the western Gulf coast, and about the passes near the mouth of the Mississippi River.

8. BONAPARTE'S GULL (*Larus philadelphia*). Like the preceding, a regular but not abundant winter visitor. It arrives in September and

¹ For Parts I and II, see Volume XXIII, pp. 1-15, 275-282.

leaves about the middle of April. It is usually found in company with the other gulls, on the coast or in the interior.

9. GULL-BILLED TERN (*Gelochelidon nilotica*). Resident on the western coast and its islands, frequenting shallow waters near the shore, and breeding in July and August. It is not abundant, occurring singly and in flocks of three or four, in company with other gulls and terns.

10. CASPIAN TERN (*Sterna caspia*). Resident; fairly common along the coast, breeding on low sandy islands; numbers increased in winter; it occurs singly or in flocks of two or three, and associates freely with other gulls and terns, often congregating about the oyster and shrimp canneries. It never occurs far from the coast.

11. ROYAL TERN (*Sterna maxima*). Resident; very common along the entire extent of the coast; breeds in June and July in about the same situations as the Caspian Tern. If one set of eggs is destroyed by a storm, a second set is laid. Like the preceding, it flies singly or in small flocks, though frequently hundreds may be in sight at one time. After the breeding season, it roams inland, and may be found in fall and winter on inland waters, especially in the northwestern part of the State. It probably never occurs on the Mississippi River except very near the mouth.

12. CABOT'S TERN (*Sterna sandvicensis acutiflvida*). Fairly common resident, numbers increasing, however, about the end of September. In distribution, it is chiefly a seabird, being especially common on the Chandeleur Islands and Breton Island.

13. FORSTER'S TERN (*Sterna forsteri*). Resident on the larger Gulf islands, but in very limited numbers; it grows commoner in fall, occurring both inland and coastwise.

14. LEAST TERN (*Sterna antillarum*). An abundant resident in all suitable localities along the coast. Has been observed also at Vicksburg in the middle of July, and a few miles westward, near Tallulah, in Madison Parish, Louisiana, where it appeared to be well established, though no evidence of its breeding there was secured. Those seen in Madison Parish were observed repeatedly flying along a slough. In fall and winter, it is regularly seen far inland in flocks of eight or ten.

15. SOOTY TERN (*Sterna fuliginosa*). This species has about the same breeding range on the coast as the preceding, and is frequently associated with it.

16. BLACK TERN (*Hydrochelidon nigra surinamensis*). A common transient in spring and fall; it arrives from the north early in August, and has been seen at Bay St. Louis, Miss., as early as July 26. It occurs chiefly coastwise, but was seen at New Orleans, August 15, 1901, during a Gulf hurricane.

17. NODDY TERN (*Anous stolidus*). Resident, but never common; breeds on some of the islands, especially Timbalier and Chandeleur.

18. BLACK SKIMMER (*Rhynchops nigra*). A common resident along the coast, breeding on most of the islands, and in some places along the shore of the mainland. Usually flies in flocks of ten or more. In habit,

somewhat crepuscular, in this particular being unlike the gulls and terns.

19. BOOBY (*Sula sula*). Though this species doubtless occurs in Louisiana at all seasons, it should be regarded as an uncommon and irregular visitor from further south, rather than as a resident. Specimens were taken in September, 1884, on the Mississippi about fifty miles below New Orleans, and three were observed at Red Pass, near the mouth of the Mississippi, on January 15, 1901.

20. GANNET (*Sula bassana*). This species is an occasional winter visitor; it has been observed several times at the Rigolets, in southeastern Louisiana. Like the preceding this species seems to occur unassociated with any other species except possibly the cormorants.

21. ANHINGA (*Anhinga anhinga*). Resident along the Gulf coast, following the rivers and larger bayous inland, and preferring open swamps, especially those of cypress and tupelo, for its nesting places. In the breeding season it is associated with several of the herons, especially the Great Blue Heron, the American Egret, and the Little Blue Heron. The breeding season includes most of May, June, and July. There are usually three birds to a brood. This species has been found breeding in willows in an abandoned and flooded rice field on the edge of a swamp near the Mississippi in Plaquemines Parish. Nearly a dozen nests have been seen in a single clump of willows. The nests in this case were mere platforms, something over a foot in diameter, and having moderate depressions. The behavior of the young at the conclusion of the nesting period is often peculiar. A nestling almost fully fledged has been seen to fall precipitately from a branch of its nest-tree, on the approach of a person, striking the marsh below head first, and emitting a strange, harsh note in its descent. The adults resent the presence of intruders about a nesting colony by flying back and forth and uttering peculiar hissing notes. The attitude of both young and old when perched on the trees of a site selected for a nesting colony is often peculiar. The adults frequently sit with their wings extended for considerable intervals, while the young huddle together in attitudes that frequently suggest a hawk. Under such circumstances, on account of the coloring of the young at a certain period, the resemblance to the Red-shouldered Hawk is marked.

Although this species occurs commonly along the coast, it does not breed on or near salt water.

While the Anhinga is resident in Louisiana, it is always much more conspicuous in summer, at which season it is not unusual to see these birds soaring at considerable heights in the localities where they breed. The Anhinga resorts with much regularity to the same nesting sites every year.

22. DOUBLE-CRESTED CORMORANT (*Phalacrocorax dilophus*). This is a winter resident, not common, and found almost exclusively along the Gulf coast. Three or four are usually seen together. It has been seen on Lake Catherine as late as April 14 (1904).

23. FLORIDA CORMORANT (*Phalacrocorax dilophus floridanus*). This species is much commoner than the preceding, though found in the same

localities. It breeds wherever it occurs. It is usually seen in flocks of from six to ten. The distribution and abundance of this species is practically unchanged throughout the year.

24. MEXICAN CORMORANT (*Phalacrocorax mexicanus*). In the lower sections of the State, this species is a common resident, and in habits, distribution, etc., agrees closely with the preceding species. Like the others, it is occasionally found inland on the larger bodies of water.

25. BROWN PELICAN (*Pelecanus fuscus*). This species is abundant along the Gulf coast, especially about the islands. It usually occurs in flocks of less than twenty. Although essentially a coast bird, it straggles inland in winter, though very rarely leaving the southern part of the State. It breeds almost exclusively on the coastwise islands in company with gulls and terns.

26. WHITE PELICAN (*Pelecanus erythrorhynchus*). This is a winter visitor only, and never occurs in very large numbers. It occurs chiefly along the coast, but is occasionally found inland about the larger bodies of water. Numbers sometimes winter at various points along the Mississippi River, even in the northern part of the State. It is present from about October 1 to March 1.

27. MAN-O'-WAR BIRD (*Fregata aquila*). Resident and breeding along the Gulf coast, especially the eastern part. The breeding season includes most of June, July, and August. Little is seen of this species along the mainland during the breeding season, but about August 1 it becomes rather conspicuous at some points on the coast. In calm weather numbers may often be seen soaring at a considerable height. During heavy storms, this species is sometimes driven a considerable distance inland.

28. AMERICAN MERGANSER (*Merganser americanus*). Regular winter visitor, but of late years less common; in fact, its numbers seem to be slowly but steadily decreasing. It is found chiefly in small flocks along the coast, and seldom remains long on inland waters.

29. RED-BREASTED MERGANSER (*Merganser serrator*). Like the preceding, a winter visitor, but much commoner. It is usually seen in small flocks, however. On inland waters, it is rather common. Being more of a maritime species than the following, however, it is called by the creoles "Bec-scie de mer."

30. HOODED MERGANSER (*Lophodytes cucullatus*). Essentially an abundant winter visitor; yet a few remain throughout the year, while reports of its nesting are rather numerous. It is known to breed in the interior as well as coastwise; very young birds have been observed the latter part of June. The localities in which this species occurs as a breeder frequently change from season to season. Local (Creole) name: Bec-scie (Saw-bill).

31. MALLARD (*Anas boschas*). One of the best known of the ducks in Louisiana, being a winter visitor throughout the State and usually occurring in flocks of from ten to one hundred individuals. The first arrive early in October, but most of these appear to be transients.

It is not until the early part of November that the species becomes common. The earlier arrivals are particularly associated with Green-winged Teals and to a considerable extent also with Pintails, Gadwalls, Baldpates, Ring-necks, and Shovellers. The bulk of winter visitors are present from the early part or middle of December until the latter part of January, the Mallard being among the very first ducks to start north at the close of winter. A good many of the individuals arriving at the beginning of the winter pass further south, returning when the last of the winter bulk are leaving the State, so that the greatest number are often present at the beginning and at the end of the season. It is doubtful whether any of the winter visitor individuals remain in southern Louisiana later than February 15. Most of the transients have disappeared by the middle of March at the latest. (Obs. In a general way, the movements here traced with reference to the Mallard, apply with more or less force to most of the other river ducks. Exceptions will be noticed under the accounts of the several species.)

Owing to constant persecution along the coast, the Mallard, like other ducks wintering in Louisiana, is very wary; the feeding grounds in the marshes are ordinarily deserted by daybreak, and open waters are generally frequented during the hours of daylight.

Several peculiar specimens of the Mallard have been taken in Louisiana. Three of these were partly albino; one was a male and the others females; all were marked exactly alike; they were shot at Vinton, in southwest Louisiana on January 4, 1892. An exceedingly strange specimen is a hybrid between the Mallard and Pintail; the bird was an apparently fertile drake. One side bears the exact markings of the Mallard and the other of the Pintail. (For a detailed account of this specimen, see Auk, XVII, April, 1900, p. 170.)

Local names: French Duck; Canard français.

32. BLACK DUCK (*Anas obscura*). Formerly a common winter visitor, but growing steadily rarer of late years. It prefers the open Gulf waters to the inland. It is usually found in flocks of eight or ten, while sometimes a few will be found with a flock of Mallards.

33. FLORIDA DUCK (*Anas fulvigula*). A regular resident on the coast, and especially on the islands, whence its local name, *canard des isles*. It is fairly common and breeds wherever it occurs in the regions just mentioned. Its numbers are greatly increased during winter, and at that season it may be found on open lakes, even in the northern part of the State.

34. GADWALL (*Chauleasmus streperus*). This species is one of those forming the normal winter duck population in Louisiana, and in the matter of abundance, stands about on a par with Mallards, Baldpates, Pintails, Green-winged Teals, and Lesser Scaups, being rather more abundant than Red-heads and Ring-necks. As in the case of the Mallard, the first come by the early or middle part of October, and continue to increase decidedly until the middle of December, then remaining in statu quo or showing something of a decrease, according to the nature of the winter, until the

middle of January. A strong northward movement begins at that time, and while it consists largely of individuals that have wintered in Louisiana, it is doubtless augmented also by the first passage of transients. This later movement continues more or less freely until about March 15, after which date, duck migration is restricted almost entirely to a few species, among which the Gadwall is seldom if ever found.

Local names: Gray Duck; Canard gris.

35. BALDPATE (*Mareca americana*). Though rather less common than the preceding, this species exhibits about the same movements.

Local names: Zin-zin and Widgeon.

36. GREEN-WINGED TEAL (*Nettion carolinensis*). At no time as common in Louisiana as the Blue-winged Teal becomes there in spring, the Green-winged Teal is present in large numbers for a greater period than the Blue-winged Teal. Numbers arrive in the fall not later than October 1, thus preceding most of the other species. They are particularly abundant in fall. Many remain in southern Louisiana throughout the winter, departing, with the bulk of the winter ducks, early in February. Individuals that winter extralimittally are rather late in returning, but the average time of their spring flight is much in advance of that of the Blue-winged Teal, so that the last have usually passed before April.

Local names: Cognotte; Sarcelle d'hiver (Winter Teal).

37. BLUE-WINGED TEAL (*Querquedula discors*). Leaving aside the possible occurrence of this species as a breeder in Louisiana, it is nevertheless present there for a large part of the year. Returning transients appear in Louisiana between September 1 and September 15. Individuals of this class continue common throughout the fall and with those arrivals that will remain throughout the winter make the species abundant until cold weather in November. From then on, the numbers are decidedly decreased until the middle or latter part of March, when the bulk of transients begin to arrive, the transient movement continuing in force until the first half of May, while the writers have positively recorded the species in southeastern Louisiana as late as May 21. Some hunters claim that a few of this species breed regularly in southern Louisiana, and it is not at all unlikely that such is the case. No authenticated instances, however, have come under the observation of any of the writers.

Local names: Sarcelle automniere; Sarcelle printanniere. (Spring or Fall Teal).

38. CINNAMON TEAL (*Querquedula cyanoptera*). This species is rare in Louisiana. All specimens recorded have been taken in fall and winter in the southern part of the State.

39. PINTAIL (*Dafila acuta*). In one important particular, the movements of the Pintail in Louisiana differ from those of the Mallard, Gadwall, and associated species. The spring transients are the latest of all ducks except the teals and the Shoveller, and this in spite of the fact that winter visitant individuals, as with similar individuals of the Mallard, move northward very early, probably never later than the middle of January.

But the principal flights of transients occur in spring, even in April, during the passage of Blue-winged Teals.

Local names: Paille-en-queue (Straw-tail); Sprigtail.

40. WOOD DUCK (*Aix sponsa*). Though this species is found to a considerable extent in swampy country coastwise, the characteristic habitat of the Wood Duck in Louisiana is the heavy inland swamps about lakes or along rivers. It is extremely common, for instance, about shallow sloughs in heavy hardwood growths along the Mississippi in northeastern Louisiana. The dense forests along the lower course of the Atchafalaya, however, and some of the swamps about lakes and rivers in southwest Louisiana are likewise very attractive to this species. An undoubted factor in determining the abundance of the Wood Duck is the presence of the water-chinquapin (*Nelumbium luteum*). As a food of the Wood Duck the seeds of this plant are extremely important.

In the southern part of the State at least, the Wood Duck is seldom seen in winter. Nesting usually begins in the early part of April.

Local name: Brancheur (percher).

41. RED-HEAD (*Aythya americana*). This species is rather common coastwise and is found chiefly from the middle of November to the middle of February.

Local names: Violon (Violin).

42. CANVAS-BACK (*Aythya vallisneria*). The numbers of this species are probably on a steady decline. There are certain little-visited localities, however, especially near the mouth of the Mississippi, where it still occurs in considerable abundance during some seasons. Like the Red-head, it prefers the coast; its migratory movements, also, are similar to those of the Red-head.

Local names: Canard cheval.

43. AMERICAN SCAUP (*Aythya marila*). The occurrence of this species is confined chiefly to the colder parts of the winter. This species is seldom found away from the coast, and occurs more frequently on the open Gulf waters than any other species. In distinction from the next, it is called by the Creoles "Dos-gris de mer."

44. LESSER SCAUP (*Aythya affinis*). This duck is probably steadily commoner than any other species found in Louisiana. It is present from about October 15 to March 15. It is most abundant, of course, in the southern part of the State. At times, it occurs in large flocks; again, many single individuals may be seen on the inlets and salt lakes of the southeastern part of the State.

Local name: Dos-gris (Grayback).

45. RING-NECKED DUCK (*Aythya collaris*). This is a common winter visitor; its movements are about the same as those of the Lesser Scaup.

Local names: Black Duck; Canard noir.

46. AMERICAN GOLDEN-EYE (*Clangula clangula americana*). This species is a rather uncommon winter visitor; it appears to loiter in spring, and on June 15, 1894, Mr. A. B. Blakemore shot a female on Cat Island, off the coast of Mississippi.

47. BUFFLEHEAD (*Charitonetta albeola*). Common as a winter visitor. Local names: Marionette; Butterball.

48. OLD-SQUAW (*Harelda hyemalis*). A male in full winter plumage was shot on Bayou Barataria February 13, 1899. At the time of the capture of this specimen a severe blizzard was sweeping the South. Zero temperatures were reported at points near the Louisiana coast. The specimen in question is in the museum of Tulane University.

49. BLACK SCOTER (*Oidemia americana*). This species has been taken near Lake Catherine. There is a Louisiana specimen in the Kohn collection at Tulane University.

50. WHITE-WINGED SCOTER (*Oidemia deglandi*). This species is occasionally found on the Gulf Coast in winter. It rarely goes inland.

51. SURF SCOTER (*Oidemia perspicillata*). This species also is a rather rare winter visitor. A male killed on Bayou St. John, near New Orleans, on March 20, 1890, is now in the Kohn collection at Tulane University.

52. RUDDY DUCK (*Erismatura jamaicensis*). This species is a very common winter visitor. Local name: Marteau.

53. LESSER SNOW GOOSE (*Chen hyperborea*). Winters in considerable abundance along the coast.

54. GREATER SNOW GOOSE (*Chen hyperborea nivalis*). Not so common as the preceding, but its movements are about the same.

55. BLUE GOOSE (*Chen caerulescens*). Rather common in winter on the coast.

56. WHITE-FRONTED GOOSE (*Anser albifrons gambeli*). Present, like most of the geese, from October to March, or the early part of April. Common.

57. CANADA GOOSE (*Branta canadensis*). The commonest of the geese in Louisiana. Its movements are about the same as those of the preceding species.

58. HUTCHINS'S GOOSE (*Branta canadensis hutchinsii*). This form is a rather common winter visitor, and is usually found on the coast.

59. BRANT (*Branta bernicla*). An occasional winter visitor.

60. FULVOUS TREE-DUCK (*Dendrocygna fulva*). Though a native of tropical and subtropical America, this species has been observed in Louisiana, not as might have been expected, in summer, but in fall and winter. Considerable flocks have been noted at various times. Its occurrence in Louisiana, however, is decidedly irregular.

61. WHISTLING SWAN (*Olor columbianus*). In recent years, the occurrence of this species in Louisiana has become very rare and irregular.

62. TRUMPETER SWAN (*Olor buccinator*). In the past, this species has proved commoner than the preceding, especially about the mouth of the Mississippi.

(To be continued.)

AUTUMN WARBLER MIGRATION.

BY J. CLAIRE WOOD.

IN 'THE AUK,' Vol. XXIII, No. 1, January, 1906, I gave an account of the Warblers noted here in the autumn of 1905. That season I devoted my entire spare time to them from August 20 but this autumn I did not start until September 3; consequently, the following list is inaccurate as to first arrivals but I doubt if anything escaped notice from September 3 to the end of the season. A Mourning (*Geothlypis philadelphia*) and several Nashville Warblers were seen in 1904 but were absent in 1905, while the Tennessee was absent in the former season and common in the latter. This irregularity in warbler migration was interesting, and I wished to learn what percentage of species were subject to it and also to establish a better knowledge of the relative abundance and time of departure by a comparison with the present season of 1906. To get the most uniform results I hunted over the same territory, with the exception of one or two days, and the comparison was satisfactory until displaced by an abnormal change in temperature. During the night of October 9 the mercury dropped to 33°, and we had a genuine heavy snow storm on the 10th, but the snow melted as it fell. Toward evening the mercury began to drop and reached 25° at 3 A. M. on the 11th where it remained for three hours. This killed all plant life, susceptible to frost, and its blighting influence was noticeable throughout the woods on the 14th; even the live oak leaves were affected, while the beeches were a mass of yellow and no longer yielded a food supply to the warblers. With the exception of Black-throated Blue and Myrtle, all the species seen that day were hurrying south under pressure of unnatural excitement, and had probably undergone considerable hardship, as the ground was covered with half a foot of snow sixty miles north of here and about three inches at half that distance.

The woods, where I hunted, had been greatly reduced in size since 1905, and I was able to note the course of arrivals in many cases and departure in nearly all. The length of the River Range is about thirty miles and its general course approximately S. 45° E. This woods is situated on the south side and is the last piece of

thick timber as you follow down the river, there being only a grove between this point and the Detroit River. The bulk of warblers came down this water-way and during the earlier part of the season continued to the grove from whence they must have turned south, as further progress was barred by the Detroit River.¹ Later, however, my piece of timber was the limit of their eastern movement and they went due south from here to a large piece of thick woods. This was the program in 1905 except from September 20 to October 5 when they went southwest to follow a chain of large woods that extended far southward. The lesser number of warblers came from the northeast and had evidently followed the Detroit River. During September about twenty-five per cent. were apparently not migrating but taking life easy and remaining in the woods. I suppose these were the main night travelers and if so, when do migrating warblers sleep? All seen by me exhibited the characteristic activity of the family. We all know that large numbers travel by night, but who has seen them asleep during the day? Judging from my experience with night migration, they sleep from about 11 P. M. to 4 A. M. Of course, I really know nothing positively, and my belief is based only on the fact that the birds were not heard calling between the above mentioned hours, and on the actions of a captive Indigo Bunting (*Cyanospiza cyanea*). This bird was not over a month old when trapped in the summer and soon showed no desire to escape from its cage. It appeared contented, and slept peacefully all night until the advent of the fall migration; even then, there was no change in the day time, but soon after dark it became restless. The performance began with a hopping to and fro on its perch with frequent pauses to partly squat, as if about to spring into the air. At the first call note of a passing migrant it uttered a sharp metallic chirp and flew about the cage, making frantic efforts to escape and, when somewhat exhausted, climbed parrot-like about the cage top trying to force its head between the wires. Toward midnight it quieted down and slept a few hours but became active before daylight. This dominating influence ceased suddenly the latter part of October,

¹ It is an interesting fact that while the Warblers came down this water-way two thirds of the Robins took the reverse course. They mainly came from the east and had probably crossed the Detroit River, but several large flights came from the south.

and had the bird been released after that period it probably would have perished from loss of that mysterious guidance to the south, but, opposed to this, we find the latest warblers the most eager to accomplish their journey. To my mind the early migration demonstrates an instinctive movement. Nothing would seem more natural than the warblers retreating after experiencing actual contact with cold or lack of food, but the first birds are on their way long before the least intimation of cold and while food is abundant. I have seen several small flocks of juvenile Redstarts migrating July 4, and this species first reaches the West Indies the second week in August. My personal observation of their movement here extends from July 4 to October 7. What possible physical condition or prescience could maintain so uniform a southward movement over such a long period, and through seasonal changes, and all it implies, as comprehended by a comparison of July with October? Why should they migrate at all? Why has not nature modified these warblers to the condition of Chickadees? Perhaps the Myrtle Warbler is leading and the others following a gradual modification in favor of permanent northern residence. A few Myrtles winter at least as far north as Maine. At one time they were probably resident in South America and later all wintered there, and at some distant period may become entirely resident on their present breeding grounds.

My observations of the local movement inclines me to believe that the majority of warblers follow the water-ways, probably because the bordering timber is the most suitable and food more abundant. This refers mainly to the earlier birds traveling by easy stages and not handicapped for time. On occasions they do not hesitate to take a northerly course, if the woodlands are more congenial to their tastes, but that they retain a correct sense of direction is plainly shown when a point is reached where further progress would impair the southward movement. This belief is based on observations in Grosse Pointe Township and vicinity where there are no water-ways bordered by timber. Here, on September 3, I discovered a large company of mixed warblers in Gratiot Twp. and followed them about N. 45° E. across Grosse Pointe Twp. and Village of Grosse Pointe Farms to the shore of Lake St. Claire. From this point all suitable territory lay to the

north but they took the opposite direction. On the same date another flock came due east and reached the south end of a large woods. They worked through it to the northern margin and back to the starting point; thence, across the open country about S. 25° W.

From the first week in September there are always late warblers, that is, birds passing days behind the bulk of their species. As the season advances these naturally increase in numbers as more species become affected. After early September single birds or small companies are met with that have come to realize they are due miles to the south, and I doubt if they are in any way influenced from their purpose by convenient food supply, characteristic social tendency or geographical conditions. I spent many hours with the Black-throated Blue Warblers in October. They were neither uneasy nor migrating and assisted me as decoys. They always had a friendly call note for passing warblers, but with decreasing effect as the month advanced. A warbler, bent on business, does not fly from tree to tree but takes spurts of about 100 yards and, after hastily snatching a morsel or two of food, repeats the operation. One or two of the Black-throated Blue Warblers would reply to the first far away note of an approaching warbler and the bird would be sure to pass through or above the flock, exchanging greetings but seldom stopping. This often afforded me a quick wing shot but if not, I could sometimes intercept the bird at the woodland margin, as I knew the point where it would leave, and all such warblers remain longer in the last tree than anywhere while passing through the woods. A late Black-poll once joined a passing flock of Robins but they were going west and the warbler soon turned to the south. All warblers seem to me somewhat indifferent to cold, but snow inspires alarm in even the latest, and a general rapid southward movement — the Myrtle excepted.¹ Of the warblers noted October 14, three species were passing more than a month later than the bulk of their kind. In a measure, this is owing to early species getting into flocks of the later kinds and being influenced by them. Another apparent reason is the

¹ They care nothing for the snow in spring if the mercury is above freezing and the food supply not affected. The only Blue-winged Warbler seen this year was located by its song and in a blinding snow storm in early May. I also followed and watched five other species during that storm and they totally disregarded it.

reluctance of some adult birds to leave their summer quarters. A few adult male Yellow Warblers remain here at least two weeks after the last young bird has departed but, as the last of certain northern species may be represented by either or both adult and young, it would seem as if some of the lingering adults influenced a few juveniles to remain with them and sometimes left the trusting youngsters far in the rear in the wild panic to flee the country.

Satisfactory data, relative to the general distribution of autumn warblers, can only be acquired by the liberal use of a gun. Little reliance can be placed in field-glass observation and I doubt if anyone, familiar with the family, is willing to accept such records as positive in unusual cases, as when birds are exceptionally early, late or rare. Of course the adult males of a few species can be identified with certainty and a bird student, with enough knowledge to have any business in the field, should know the Myrtle in all plumages but he can get no accurate idea of the number of species in his neighborhood, their relative abundance, etc. In just one autumn I established a better knowledge of the warblers here than other parties in fifteen years of field-glass observation.¹ In order to decrease the mortality I used a field-glass as much as possible. It was very useful when warblers were near the ground or in trees to the height of about thirty feet, if the birds possessed distinctive under markings. However, it was practically useless at that

¹ I mention this because my admission, in a previous paper, of having taken specimens aroused the indignation of a certain class and appealing letters were sent to the state game warden and others. I was born a lover of birds and have always taken an interest in their welfare, but when it becomes necessary to secure them in order to do certain work well, I feel justified in doing so. However, discussion is futile but the above class should know that birds will be taken for some time to come. Probably the most effective method of determining routes is "bird tagging," and sooner or later a society will be organized to take up this work, and effective results will depend almost entirely on birds secured; furthermore, much material is at present required to permanently establish the subspecies and define their ranges. It is true that some disapprove of this "hair splitting" but for no good reason that I can see, except they are not interested in the subject or know nothing in regard to it. However, in this, as in other branches, you can not suppress the taste for knowledge and it is better to work out the problem soon as possible than allow it to drag along with forms accepted and then rejected as in the past. In his great work 'The Birds of Middle and North America,' Prof. Ridgway laments the lack of material not only in the foregoing connection but even in establishing plumage variations of actual species. Without further illustrating the necessity of securing birds at the present time suppose we look into the future centuries and we find a subject of great interest requiring a mass of new material. I refer to differentiation or modification.

height against strong light or after sundown, and very uncertain at all times when the birds were in the tall tree tops. To accomplish good results in warbler hunting requires hard work and much patience. At times the woods are apparently void of warblers, but experience has taught me that, at least, a few may be found in every suitable woods. This scarcity may occur in the height of the season and is probably due to drainage by a flock of travelers. If you keep constantly in motion and attend strictly to business the reward is certain, although the amount of success depends on how familiar you are with the woods or, rather, the more favorable places. The terrestrial kinds are not difficult to discover, as you can penetrate their haunts and force them from cover, but the more arboreal species can not be reached in the thick foliage of the forest trees. One of my first experiments was to climb a tree, commanding a view on all sides, and wait for the birds, but in this I was depending entirely on such as chanced in one little spot of a large woods, and even then they were more difficult to see than when looking from the ground, while it was no easy matter to mark down anything shot, and if wounded it was sure to escape before I could reach the spot. I have seen a winged Nashville and Tennessee crawl entirely out of sight beneath a dead leaf when other concealment was wanting. Another of my errors was wasting time in exploring unlikely and out of the way places, believing such localities the most liable to contain rarities. Another point, to be remembered, is that loud noises inspire alarm and the birds flee at the report of a gun; so, by the time you have picked up your specimen the remainder have vanished from sight and hearing. Never shoot into a flock without first ascertaining their direction of travel and you can then sprint one or two hundred yards and get some trace of them again. In the woods the migrating flocks are usually of many species and the beginner is liable to see only the prominent kinds. Sometimes a small company of three or four individuals will work through the woods so much scattered that there will be a hundred yards or so between each bird. They remain silent, except while flying from tree to tree when a sharp peep is uttered to keep in touch with one another. In a case of this kind success depends on quick work and some experience. It does not pay to watch the water holes, as migrating warblers will seldom come down to drink and bathe. A notable fact is that

the success of arboreal warblers in eluding detection is in no way due to wariness or sagacity. They feel absolutely safe in the tree tops and are totally indifferent to what transpires on the ground beneath. The cause is protective coloration and food habits that keep them among the slender twigs and leaves. Of this type is the Tennessee. On windy days they are practically safe among the agitated leaves but are betrayed in calm weather by their natural activity. As another type the Black and White may be mentioned. They spend much time about the tree trunks and large limbs and can not be overlooked. A mounted owl would make an excellent decoy.

In number of species the Mniotiltidae surpass all other families here, and rank second in abundance of individuals. During 1906 I noted thirty species, or six in excess of the Fringillidae. The following data refer to Ecorse Township, Wayne Co., Michigan, and the summer and autumn of 1906, except where otherwise stated.

Warblers seen in spring but absent in fall were: Blue-winged (*Helminthophila pinus*), Orange-crowned (*Helminthophila celata*), Louisiana Water Thrush (*Sciurus motacilla*), Kentucky (*Geothlypis formosa*), Mourning (*Geothlypis philadelphia*) and Wilson's (*Wilsonia pusilia*) — all the best possible for identification.

In preparing the following list I have included a few birds with haunts so similar to the warblers that they were constantly under notice.

YELLOW-BELLIED FLYCATCHER (*Empidonax flaviventris*).—One-noted Sept. 15. Exceptionally common in September, 1905.

RED-BREASTED NUTHATCH (*Sitta canadensis*).—More common than any other season in my recollection. Absent in autumn of 1905. Secured a male January 11, 1891, which is the only winter record here I am aware of.

RED-EYED VIREO (*Vireo olivaceus*).—Abundant until Sept. 15; then rare and last seen Sept. 30. Common 1905, and the last seen were secured Oct. 12 and 15.

PHILADELPHIA VIREO (*Vireo philadelphicus*).—Absent, but noted in spring of 1906 and Sept. 3, 5, 10 and 24, 1905.

WARBLING VIREO (*Vireo gilvus*).—No autumn records in three years in this portion of Ecorse Twp. Common in spring.

YELLOW-THROATED VIREO (*Vireo flavifrons*).—Common, inclusive of Sept. 5, and last seen on the 7th; most abundant the last week in August.

BLUE-HEADED VIREO (*Vireo solitarius*).— One adult male Oct. 9. First seen in 1905 on Sept. 28 and common that date and on Oct. 5. Last seen Oct. 8 — one specimen.

BLACK AND WHITE WARBLER (*Mniotilta varia*).— Less common than usual; not more than five seen in one day and usually one or two. Only adult male Sept. 15, but adult males are always rare in autumn. October birds have all been adult and junior females.

GOLDEN-WINGED WARBLER (*Helminthophila chrysoptera*).— Last seen August 26, one bird. This was a male but whether adult or junior is uncertain as it was not secured. Last seen August 20, 1905 — a fine adult male.

YELLOW WARBLER (*Dendroica aestiva*).— Last seen August 17 — an adult male. Six noted August 12, appeared to be adult males. Last seen in 1905 August 19. That season I gave the species especial attention and secured questionable birds — all adult males, however, from and inclusive of July 30.

CERULEAN WARBLER (*Dendroica cerulea*). Last seen August 26 — an adult male. Last seen August 24, 1905 — twenty specimens, being adults and juniors of both sexes but mainly the latter.

CHESTNUT-SIDED WARBLER (*Dendroica pensylvanica*).— One specimen Sept. 3 and one Sept. 23 — both junior males. Last seen Sept. 3, 1905 — fifteen noted and all junior birds, the two secured being males.

OVENBIRD (*Seiurus aurocapillus*).— Not taken after Sept. 5 and nothing known as to age and sex of the later birds. Not taken in 1905 though common.

NORTHERN YELLOW-THROAT (*Geothlypis trichas brachidactyla*).— Have taken no adult males after mid-September and the very latest have been junior females.

YELLOW-BREASTED CHAT (*Icteria virens*).— Last seen July 29 — an adult female in Grosse Pointe Township. Undoubtedly occurred later but this was my last visit to that locality. More common in Gratiot Township where at least six pairs nested in 1906.

AMERICAN REDSTART (*Setophaga ruticilla*).— Last seen Oct. 7 — a junior bird. The three noted Sept. 3 were adult males. Last seen in 1905 was an adult male Oct. 5, and in 1904 two adult males Oct. 2. Adult males are not common during September.

NASHVILLE WARBLER (*Helminthophila rubricapilla*).— Five birds were noted, all adults, the Sept. 23 specimen being a female and the remainder males. Absent in autumn of 1905.

TENNESSEE WARBLER (*Helminthophila peregrina*).— The most common species Sept. 5 to 15, and the first in total number of individuals for the season. Met with every day afield until Oct. 19. The Sept. 3 and 5 birds were mainly adults but the junior birds took the lead from Sept. 7 to October. The two Oct. 14 specimens were adult male and junior female. More abundant than in 1905 and absent in 1904.

WESTERN PARULA WARBLER (*Compsothlypis americana ramaLinæ*).—

Three birds noted and all adults, the Oct. 7 specimen being a male and the remainder females.

CAPE MAY WARBLER (*Dendroica tigrina*).— All adult birds except two junior females, one secured Sept. 3 and the other Sept. 30. This is the first time I have met with the species here. They ranked seventh in total number of individuals for the season.

BLACK-THROATED BLUE WARBLER (*Dendroica caerulescens*).— First noted Sept 3 — an adult male and female. From Sept. 5 to Oct. 14, both inclusive, there was a mixture of both sexes and ages. The Oct. 23 bird was a junior female. Fourth in total number of individuals for the season.

MYRTLE WARBLER (*Dendroica coronata*).— Not enough taken to judge proportion of age and sex to dates. Second in total number of individuals for the season. Much less abundant than in 1905 and departed earlier. Mr. Edward Arnold informs me he has seen this species in January near Battle Creek, Michigan.

MAGNOLIA WARBLER (*Dendroica maculosa*).— The junior birds first appeared Sept. 3 and the adults on the 15. The three Sept. 30 birds were two adults and one junior — sexes not known. Sixth in total number of individuals for the season.

BAY-BREASTED WARBLER (*Dendroica castanea*).— All junior birds and an equal number of each sex.

BLACK-POLL WARBLER (*Dendroica striata*).— The most common species Sept. 3, and third in total number of individuals for the season. Mixed adults and juniors throughout September. All the October birds were adults, mostly males, but the last specimen was a female. There is no authentic record of this species occurring here in spring but I saw what was probably a small flock May 30, 1905.

BLACKBURNIAN WARBLER (*Dendroica blackburniae*).— Eight birds noted in all, the only adult being the Oct. 9 bird; this was a male.

BLACK-THROATED GREEN WARBLER (*Dendroica virens*).— First noted Sept. 9, an adult female; then a mixture of both sexes and ages inclusive of Oct. 9. The two of Oct. 14 were adult females and the Oct. 21 bird was not secured. Fifth in total number of individuals for the season.

PALM WARBLER (*Dendroica palmarum*).— One specimen, an adult female Oct. 7.

WATER THRUSH (*Seiurus noveboracensis*).— Birds secured were of both sexes but ages uncertain.

CONNECTICUT WARBLER (*Geothlypis philadelphia*).— The two birds noted were adults. Absent in spring but taken spring and autumn of 1905.

CANADIAN WARBLER (*Wilsonia canadensis*).— One of the August 26 birds was an adult male, the first in autumn for three years.

The following list gives the date of the last summer residents and the number seen; also first and last date, with the number seen of the transient species, together with date of greatest abundance and the number; also everything noted in October. A * indicates that one or more were taken on the date to which it is prefixed.

[illegible]

A NEW AGELAIUS FROM CANADA.

BY HARRY C. OBERHOLSER.

WHEN Mr. Ridgway described his *Agelaius phœniceus fortis*¹ he possessed comparatively few breeding birds from either the United States or Canada. He therefore supposed that the breeding range of his new form was restricted to Canada, and that *Agelaius phœniceus phœniceus* extended westward over the Great Plains of the United States to the base of the Rocky Mountains. Considerable additional material, however, from Texas, Colorado, and British America, shows conclusively that, in the breeding season, *Agelaius p. phœniceus* reaches little, if any, beyond the eastern border of the Great Plains; that *Agelaius p. fortis* occupies the Plains from northwestern Texas to Colorado, Nebraska, and Wyoming; while still another form occurs in the region to the northward. The type of *Agelaius phœniceus fortis*, an autumn female from Omaha, Nebraska, belongs clearly to the southern, paler form; and as the Canadian race is thus without a name, it may be called

***Agelaius phœniceus arctolegus* subsp. nov.**

Chars. subsp.—Similar to *Agelaius phœniceus fortis*, but female decidedly darker below, the streaks more blackish and more extensive, about as broad as the white interspaces; above more blackish. Male with wing and tail averaging shorter; bill larger; and buff of wing-coverts somewhat paler.

Geographical distribution.—Montana, North Dakota, Minnesota, and northern Michigan, north to Keewatin, Athabaska, and Mackenzie; in migration south to Colorado, Texas, Illinois, and probably Ohio.

Description.—Type, adult female, No. 195233, U. S. N. M., Biological Survey Collection; Fort Simpson, Mackenzie, May 26, 1904; Edward A. Preble. Entire upper surface, including wings and tail, clove brown, with narrow marginings of buff or whitish, these most conspicuous on crown, nape, and wings, the back with a few rusty edgings; a rather ill-defined superciliary stripe of buffy whitish mixed with brown; sides of head dull buffy streaked with brown, and with a postocular and a rectal streak of sepia; lores dusky; sides of neck like the nape, but more mixed with whitish; chin salmon pink with a few faint flecks of dusky; throat white, washed with salmon pink, and narrowly streaked with clove brown, broadly so on each side; jugulum and breast white, broadly streaked with

¹ Proc. Wash. Acad. Sci., III, 1901, p. 153.

clove brown, the light and dark colors here being about equal in extent; abdomen and crissum clove brown, all the feathers edged with white; lining of wing sepia brown, the coverts with buffy and whitish edgings.

This new form is much like *Agelaius phœniceus phœniceus* in color, the male in this respect being practically indistinguishable, and the female barely less blackish above and below; but in size *A. p. arctolegus* is much greater, as the subjoined measurements will show. It differs from *Agelaius phœniceus neutralis* in larger size; in more blackish upper parts, broader and darker streaks on the lower surface of the female; and paler buff on the shoulder of the male.

Breeding females from Fort Snelling, Minnesota, near Minneapolis, are rather smaller and occasionally paler below, thus verging toward *Agelaius p. fortis*; but males from the same locality show little or no intergradation. A specimen from Fort Keogh, Montana, taken May 12, 1889, probably represents the summer form of that locality, even though this individual may not have been on its breeding ground. True *Agelaius p. fortis* has not been detected east of the Mississippi River, and all records of this form from the east belong probably under *A. p. arctolegus*. The ranges of these two giant subspecies, in so far as indicated by the specimens at present examined, are as follows:

Agelaius phœniceus arctolegus.

Alberta.—Slave River, 25 miles below Peace River;¹ Outlet of Athabaska Lake;¹ Rocher River, 20 miles above mouth of Peace River.¹

Keewatin.—Painted Stone Portage, head of Echimamish River (north-east of Norway House);¹ Robinson Portage, Franklin River (east of Painted Stone Portage).¹

Mackenzie.—Fort Smith;¹ Fort Simpson;¹ Fort Resolution;¹ Big Island, Great Slave Lake;¹ Fort Rae.¹

Manitoba.—Red River Settlement.¹

Saskatchewan.—St. Louis.

Colorado.—Semper.

Illinois.—Jacksonville; Bloomington.

Michigan.—Isle Royale;¹ Porcupine Mts., Ontonagon County.¹

Minnesota.—Fort Snelling.¹

Montana.—Fort Keogh.

North Dakota.—Pembina.¹

Texas.—Seguin.

¹ Breeding.

Agelaius phoeniceus fortis.

Colorado.—Valmont;¹ Semper; Denver; Golden;¹ Loveland;¹ Pueblo;¹ Estes Park.¹

Nebraska.—Omaha; Cherry County.¹

New Mexico.—Aztec.

Texas.—Canadian;¹ El Paso; Lipscomb;¹ Hereford;¹ Cuero.

Wyoming.—Inyankara.

In the present investigation the writer has been much aided by access to the collection of the United States National Museum, through Mr. Ridgway's courtesy; and by the loan of Michigan material, for which thanks are due to the authorities of the University of Michigan Museum at Ann Arbor.

Measurements (in millimeters) of the forms of *Agelaius phoeniceus* here concerned are as follows:

Agelaius phoeniceus phoeniceus.

Sex.	Locality.	Date.	Wing.	Tail.	Exposed culmen.	Depth of bill at base.	Tarsus.
♂	Kershaw Co., S. C.	Feb. 18, 1904	118.	91.5	21.	12.	29.
♂	" "	" "	122. ¹	92.5	20.5	11.	28.
♂	Indianapolis, Ind.	Mar. 24, 1877	119.5	91.5	21.5	11.	29.
♂	Wheatland, Ind.	May 20, 1885	117.	84.	23.	12.5	30.
♂	Syracuse, N. Y.	Apr. 2, 1887	117.5	92.	21.5	12.5	30.
♂	Franklin, W. Va.	July 12, 1899	121.	94.	21.	12.5	29.
♂	Mt. Pleasant, Pa.	June 22, 1895	114.	86.5	21.5	11.5	29.5
♂	Cook Co., Ill.	Mar. 23, 1870	118.	90.5	22.	12.	29.
♂	Omaha, Neb.	Mar. 14, 1878	122.	91.5	21.5	12.5	29.
♂	Laurel, Md.	July 7, 1889	119.	91.5	22.5	12.	30.5
Average of ten males			118.8	90.6	21.6	12.0	29.3
♀	Calais, Me.	May 12, ('69?)	99.	77.	19.	9.5	25.5
♀	Kershaw Co., S. C.	Mar. 7, 1904	102.	78.	17.5	9.5	25.
♀	West Chester, Pa.	Apr. 10, 1883	99.5	72.5	19.	10.	25.
♀	Baltimore, Md.	—	98.	75.	19.	10.5	24.5
♀	Wheatland, Ind.	May 25, 1885	97.5	75.	18.5	10.	25.5
♀	" "	May 14, 1885	99.	72	19.5	10.	26.5
♀	Cook Co., Ill.	Apr. 21, 1870	102.	75.5	19.5	11.	26.5
♀	Washington, D. C.	May 19, 1889	99.	76.5	19.	10.5	26.
♀	Bainbridge, Pa.	—	98.	75.5	17.5	10.5	24.
♀	Allentown, Pa.	May, 1885,	102.	77.5	19.	11.	26.5
Average of ten females			99.6	75.5	18.8	10.3	25.5

¹ Breeding.

Agelaius phoeniceus fortis.

Sex.	Locality.	Date.	Wing.	Tail.	Exposed culmen.	Depth of bill at base.	Tar- sus.
♂	Estes Park, Colo.	Aug. 1, 1893	128.	92.5	21.5	12.	30.5
♂	Golden, "	June 19, 1905	128.5	98.	20.5	11.5	29.
♂	Valmont, "	June 15, 1905	137.	105.	23.	12.	30.
♂	Pueblo, "	July 31, 1874	128.	99.	22.	12.	30.
♂	Loveland, "	July 19, 1895	127.5	96.	21.5	12.5	32.
♂	Cherry Co., Neb.	June 20, 1889	127.5	95.5	23.	11.5	31.
♂	Hereford, Tex.	July 24, 1901	125.	89.	22.	12.	31.
♂	Canadian, Tex.	July 14, 1903	127.5	98.	23.	12.	32.5
♂	Lipscomb, Tex.	July 5, 1903	132.	97.	24.	11.	29.5
♂	Aztec, New Mex.	Dec. 5, 1893	134	102.	20.5	10.5	31.
♂	Semper, Colo.	Mar. 24, 1890	134.	106.	20.	11.	31.
Average of eleven males			129.7	98.0	21.9	11.6	30.7
♀	Omaha, Neb. ¹	Mar. 9, 1878	105.5	77.5	18.	11.5	26.5
♀	Semper, Colo.	Dec. 29, 1892	104.5	76.	18.5	11.	26.
♀	Valmont, "	June 16, 1905	102.	74.5	18.	10.5	27.5
♀	Canadian, Tex.	July 14, 1903	104.	75.5	20.5	11.	26.
♀	El Paso, "	Feb. 5, 1892	103.	73.5	18.	10.	25.5
♀	" "	"	102.	73.5	18.	11.	26.5
♀	Lipscomb, "	July 7, 1903	105.	78.	18.5	10.	26.
Average of seven females			103.7	75.5	18.5	10.7	26.3

Agelaius phoeniceus arctolegus.

Sex.	Locality.	Date	Wing.	Tail.	Exposed culmen.	Depth of bill at base.	Tar- sus.
♂	Robinson Portage, Kee.	June 27, 1900	127.	94.5	26.	12.5	28.5
♂	— Saskatchewan	—	121.5	93.	26.5	13.	29.5
♂	Rocher River, Alberta	June 5, 1901	122.	88.	24.	13.	32.5
♂	Slave River, "	June 12, 1901	125.5	91.	24.5	12.5	31.
♂	" "	June 12, 1901	124.	91.	23.5	12.5	30.5
♂	Athabaska Lake, "	June 4, 1901	123.5	90.	23.	13.	30.5
♂	Fort Smith, Mackenzie	June 21, 1901	126.5	96.5	25.5	12.	28.5
♂	Fort Simpson, "	May 18, 1904	125.5	91.	23.	13.	29.
♂	Pembina, N. Dak.	June 19, 1873	126.	92.	22.5	12.	30.
♂	Fort Snelling, Minn.	May 28, 1903	126.	91.	22.5	11.5	30.5
♂	" "	Mar. 30, 1903	130.	100.	24.	13.5	29.
♂	Isle Royale, Mich.	Aug. 18, 1905	127.5	92.5	22.5	14.	30.
Average of twelve males			125.4	92.5	24.0	12.7	30.0

¹ Type.

Agelaius phoeniceus arctolegus (continued).

Sex.	Locality.	Date.	Wing.	Tail.	Exposed culmen.	Depth of bill at base.	Tar- sus.
♀	Slave River, Alberta	June 12, 1901	102.5	74.5	19.5	11.	26.
♀	Ft. Simpson, Mackenzie ¹	May 26, 1904	104.5	74.	19.	11.	26.
♀	" "	May 27, 1904	101.	73.	18.	10.5	27.5
♀	Seguin, Texas	Nov. 8, 1904	104.5	77.	19.	10.5	28.5
♀	Semper, Colo.	Dec. 29, 1892	103.5	74.5	17.	10.	25.5
♀	Fort Smith, Mackenzie	June 21, 1901	106.	79.	19.5	10.5	26.
♀	Fort Snelling, Minn.	May 28, 1903	97.	72.	17.5	10.	26.
♀	" "	"	101.	78.	18.	8.5	24.5
♀	" "	"	100.	73.5	19.	10.	24.5
♀	" "	"	100.	75.	18.	10.	24.
♀	Isle Royale, Mich.	Aug. 18, 1905	107.	78.	20.	11.	29.
Average of eleven females			102.5	75.3	18.6	10.3	26.1

¹ Type.

GENERAL NOTES.

The Kittiwake (*Rissa tridactyla*) on the Coast of Maine in Summer.—While in Jericho Bay in 1903, my companion, Mr. Fred Rackliff, saw a small gull, with several terns, flying over a tide-rip at the White Horse Ledge. On July 11 I had occasion to go ashore on the ledge and asked him to keep a watch for the strange bird and secure it if possible. On rowing to the same place the bird was found, a shot causing it to go and alight on the Black Horse where it was secured and its identity settled. While it seemed perfectly healthy, it was in worn first winter plumage, and barren. It is preserved in my collection.—ARTHUR H. NORTON, Portland, Maine.

The Brown Pelican in Indiana.—A specimen of the Brown Pelican (*Pelecanus fuscus*) was taken by W. S. Dean at Broad Ripple, Marion County, Indiana, on March 28, 1907. Only the one specimen was seen, and it was shot while resting on a rock in White River. This is the first record, as far as I can ascertain, for Indiana. The specimen was secured for the State Museum, of which I am curator.

There is also in the museum a specimen of the White Pelican, taken from the Wabash River near Attica, Indiana, some years ago.—W. S. BLATCHLEY, Indianapolis, Ind.

The Whistling Swan in Northeastern Illinois.—While the Whistling Swan (*Olor columbianus*) is considered by no means a rare bird in the Middle West, the actual capture of a specimen is not often recorded. On November 24, 1906, I spent the day four miles north of Waukegan, Ill., where Big Dead River crosses a strip of alternate sand-dunes and marsh a mile wide and a favorite place for ducks when Lake Michigan is too rough for their comfort. I learned, from a hunter, of a swan which had been shot and on my way back to Chicago stopped long enough at Waukegan to secure it. It proved to be an adult male in fine plumage. Length 53 inches, spread 83 inches, weight 30 pounds 8 ounces.

Later I wrote to Mr. H. L. Potter, who shot it, and I quote from his reply as follows: "It was killed at what is known as Farnhams Point in Big Dead River, Nov. 22, 1906. It was a lone bird, and was probably driven in to rest by the heavy wind and storm, which had lasted about three days, as they never stop here except to rest in stormy weather.

"I had shot some ducks which had drifted across and had to pole over on a piece of timber; after securing the ducks I walked up the river some distance to the 'Point' and stepping up behind some bushes to look ahead saw something out on the marsh at one side of the river, but was not sure what it was, although my suspicions were strong enough to cause me to put in a couple of charges of BB shot.

"The swan must have been asleep or dead tired as it never noticed me until I had stepped out from the cover and walked 20 or 25 yards, when all at once it raised up and I killed it the first shot."

Mr. Potter's supposition that it was driven in by stress of weather is borne out by the fact that the swan's stomach was empty. The bird, for a swan, was not over fat, but sufficiently so to test the enthusiasm of any but an old timer.—FRANK S. DAGGETT, *Oak Park, Ill.*

The Glossy Ibis in Central New York.—On May 11 of the present year three Glossy Ibises (*Plegadis autumnalis*) were seen to alight in the Montezuma Marsh at the foot of Cayuga Lake, by Mr. Foster Parker, who shot and preserved two of them. About ten days later he saw three others, flying high over the marsh.

Although the bird is of extremely irregular occurrence in the Middle States, the fact that two separate companies were seen makes it probable that others may have come this way, and it is hoped that this notice will cause any other observers who have been so fortunate as to see the bird to put it on record.—LOUIS AGASSIZ FUERTES, *Ithaca, N. Y.*

Another Specimen of Cory's Bittern.—The University Museum, University of Michigan, has recently secured a specimen of Cory's Bittern (*Ardetta neoexena*), a fact which it seems advisable to record in view of the rareness of the species. This specimen was taken near Toledo, Ohio, on May 25, 1907, by Mr. W. P. Holt. It was found with a large colony of Least Bitterns (*Ardetta exilis*) in the swampy tract of country east of Toledo.

The specimen is an adult male, and is apparently typical of the species. The crown is black, the front of the neck chestnut, and the abdomen, tibia, and sides, smoky brown and chestnut, with a few white, and black feathers. The lesser wing-coverts are black, the median wing-coverts chestnut.

The University Museum is indebted to Mr. W. P. Holt (the collector) for this specimen.—ALEXANDER G. RUTHVEN, *University Museum, University of Michigan.*

The Little Blue Heron in Philadelphia County, Pa., in Spring.—The Little Blue Heron (*Florida carula*) is of extremely rare occurrence in the vicinity of Philadelphia during the spring, but it was the writer's good fortune to see one of these interesting and fast-disappearing birds on May 11, 1904. It was seen at Holmesburg, Philadelphia County, flying slowly down the Pennypack Creek, above tidewater, toward the Delaware River, up which it evidently had previously ascended. It was a male and flew past within less than thirty feet of me, flying about twenty feet above the water, and was well seen and its identity positively determined.

The Little Blue Heron annually ascends the Delaware River in summer after the nesting season in Virginia and other southern States, often as far as Trenton, but it is of extremely rare occurrence in the spring, as already indicated, so much so, indeed, that I have been unable to find any spring record of it in the Delaware Valley during recent years. The bird seen by me was evidently a straggler from its breeding ground in the South, to which it probably went afterwards, as it was not seen again.—RICHARD F. MILLER, *Philadelphia, Pa.*

A Woodcock Nesting in St. Louis, Missouri.—On April 16, 1907, a workman on the grounds of Washington University, St. Louis, told me he had found the nest of a "Penguin." He had also observed the bird at close range, having lifted it off the nest. I examined the nest and eggshells (for the birds had hatched and left the nest by that date) and found them to be those of a Woodcock. The workman also confessed that I was right when shown a mounted specimen. The remarkable feature of this nest was that it was within fifty yards of a large dormitory in process of construction and in a much frequented part of the grounds. The nest was placed in a large patch of dried weeds and grasses.

Dr. Otto Widmann informs me that he started a Woodcock from his back-yard in a thickly settled portion of the city at noon on May 17th. Woodcock have been reported also from at least one other locality within the city limits.—ROGER N. BALDWIN, *St. Louis, Mo.*

The Stilt Sandpiper in Massachusetts.—On August 9, 1906, while gunning in Chatham, Mass., I shot a Stilt Sandpiper (*Micropalama himantopus*). It was the only one we saw, and the local gunners said it was the first one that had been seen there for several years.—CHAUNCEY C. NASH, *Boston, Mass.*

The White-rumped Sandpiper in Michigan.—In 'The Auk,' XXIV, p. 140, Messrs. Swales and Taverner practically question my veracity regarding the White-rumped Sandpiper near Port Austin, Huron County, Michigan. Twice, during the last two years, I discussed this sandpiper with Mr. Taverner and on both occasions stated that I could see no reason why we should not meet with it here in Wayne County, as I found it of regular occurrence near Port Austin, and I predicted that some day we would secure specimens here. In view of the fact that this sandpiper was considered very rare in the State, it seems impossible that Mr. Taverner could have forgotten the above conversations, yet he says: "Mr. Wood's statement that this species is common in eastern Michigan we received with a good deal of surprise." Later, when my prediction came true, and both Mr. Taverner and myself took specimens, it seems to me that he might have accepted the fulfilment of my prognostication as a verification of my Port Austin observations. I mentioned the results of my Port Austin trips to Mr. Swales and clearly recollect speaking of this sandpiper.

In 'The Auk,' XXIV, p. 97, I illustrate my belief that the taking of a bird with the skin of the abdomen thickened and other indication of having recently bred was not positive proof that it did so in the locality where taken, and in 'The Auk,' XXIV, p. 145, Mr. Taverner considers this an "oblique criticism" of his record of the Savanna Sparrow breeding in St. Clair County ('The Auk,' XXII, p. 89). He is mistaken. I had no means of knowing that he met with the species in considerable numbers together with the above mentioned indications of having bred. It is certain he recorded the species as breeding on no such evidence. Here is his record: "June 18, 1904, near Pearl Beach, St. Clair Co., on the edge of the St. Clair Flats, I found a colony of these birds breeding. About a dozen birds were seen." Not only did he find no nests or young but did not even succeed in collecting an adult bird, according to Mr. Swales. The finding of the species in considerable numbers, etc., were the result of later investigation and have nothing to do with the above record.—J. CLAIRE WOOD, *Detroit, Michigan.*

Probable Breeding of the Wandering Tattler in the Interior of Alaska.—While collecting for the U. S. Biological Survey near the upper MacMillan River, Yukon Territory, I secured an immature example of the Wandering Tattler September 5, 1904. It was first observed on some gravel bars near the head of Russell Creek, a small tributary entering the MacMillan from the north near the main forks of the latter. Although apparently a migrating bird, it was so young that it seems probable it was hatched at least somewhere in the interior of northwest America. It was quite able to fly, but the neck and head were still downy.

Further evidence of the breeding of this species has been obtained recently by Charles Sheldon of New York, who spent the summer of 1906 in the Alaskan Range and about Mount McKinley, Alaska. Mr. Sheldon sends me the following extract from his notes taken July 28, 1906, while encamped at the foot of Peters Glacier, Mount McKinley:

"Raining very hard in the morning so we could not pack the horses and start. At 2 P. M., Jack Hayden and I started to climb the ridges and look for my knife which I lost yesterday, evidently while skinning a young marmot. We killed a cony and ground squirrel with the 22-rifle, also a large female marmot. Passing two little lakes buried in the gravel moraine of the Peters Glacier, I saw a pair of sandpipers. They appeared much disturbed. As we went to shoot one, they kept flying about and lighting on willow trees. After repeated shots, Hayden finally killed one. After each shot at the bird as it sat in the tree, it would fly in a short circle and come back and alight on the tree, always near one place. The other kept flying about near. It was clear they had young ones near. A short search failed to reveal them and we had not time to look very long."

The specimen was preserved and proved to be the Wandering Tattler (*Heteractitis incanans*). It is now in the collection of Dr. Leonard Sanford of New Haven.—WILFRED H. OSGOOD, *U. S. Biological Survey.*

A Correction: Concerning the Occurrence of *Numenius borealis* on Long Island.— In 'The Auk,' XXI, 1904, p. 289, two specimens of the Eskimo Curlew were erroneously recorded from Long Island. Both were evidently the young of the Hudsonian Curlew (*Numenius hudsonicus*). That reported as in the collection of Mr. Robt. L. Peavey is certainly this species. The bill of this curlew was under 3 inches in length and it was carelessly referred to *borealis*. The elimination of these records apparently shifts the date of the last known occurrence of this species on Long Island to September 26, 1884, when two were killed at The Rockaway by Mr. Newbold T. Lawrence (Auk, II, 1885, p. 273).— WILLIAM C. BRAISLIN M. D., *Brooklyn, N. Y.*

The English Sparrow in Texas.— Prof. Estabrook in his paper on the English Sparrow in the last number of 'The Auk' (April, 1907) states: "The English Sparrow exists in enormous numbers in the whole region east of the Rocky Mountains; with the exception of Florida, where it is found in a few places, and in Texas, Oklahoma, and the northern part of Montana where it is reported absent." With regard to Texas Prof. Estabrook is misinformed, for Merriam and Barrows in their Bulletin on this species mention that it first appeared at Galveston in 1867, at Jefferson in 1882, at Houston in 1884, and at San Saba in 1886. In 1892 Attwater (Auk, IX) wrote "it is unknown as a resident in San Antonio or any of the surrounding country"; and Lloyd in 1887 (Auk, IV) does not mention it from Tom Green and Concho Counties. Finally, Judd and Beal, in 1901, simply say that it is found in certain parts of the State. When I reached Texas in 1903 I found it common in Austin and San Antonio, both near the center of the State, and learned that it had been there for a number of years; in 1904 I found it in Alpine, a small town near the southwestern border of the State, and in the year following at Corpus Christi on the Gulf Coast below Galveston, as well as at Brownsville at the extreme southeastern corner. The facts are that it is now common in all the larger towns of the State, and is so widely distributed and abundant that the farmers are beginning to seek measures to combat it.— THOS. H. MONTGOMERY, JR., *University of Texas, Austin, Texas.*

Lincoln's Sparrow (*Melospiza lincolni*) at Portland, Maine.— On June 1, 1907, Mr. Nathan Clifford Brown brought, and donated, to the Society of Natural History a perfectly fresh specimen of Lincoln's Sparrow. It was found dead by Mr. Brown on Congress Street, the principal thoroughfare of Portland.

It was prepared as a skin by the writer, when it was found to have a skull fracture, a little to the left of the median line, extending the length of the brain case, indicating the nature of its death. It is a female, showing some traces of moult, and having one ovarian ovum about as large as a No. 12 shot.

The previous local records seem to have been but three, one being a spring record, May 12, 1900 (Journ. Maine Orn. Soc., VI, p. 55). The other two were Sept. 20, 1896 (Bull. 3, Univ. of Maine), and Sept. 25, 1897 (Journ. Maine Orn. Soc., VI, p. 55).

The present specimen considerably extends the known period of migration.—ARTHUR H. NORTON; *Portland, Me.*

The Prothonotary Warbler in Colorado.—In "May or June, 1900," Mr. B. G. Voigt (deceased) shot a Prothonotary Warbler (*Protonotaria citrea*) between Palmer Lake and Monument, Colo. In "May, 1902" he shot two more specimens of the same species on the Arkansas River about two miles east of Pueblo, Colo. I examined and identified these three birds, and while doing so was struck with the paleness of the bill, corresponding to the fall and winter plumage of this species. I thereupon sent one of the birds to Mr. Ridgway, who writes that there is in the Museum collections a specimen in this plumage which was taken as early as July 28, and who thinks that the dates "May" and "June," as given to me, are certainly erroneous. I cannot vouch for these dates, nor is it possible now to confirm the note which Mr. Voigt gave me shortly before his death. This establishes another new species for Colorado.—A. H. FELGER, *Denver, Colo.*

'*Helminthophila lawrencei*' near the District of Columbia.—On May 12th the last, I took a warbler of the hybrid '*lawrencei*' type on Plummer Island, Maryland, near the camp of the Washington Biologists' Field Club. It is a high plumaged male, which for convenience may be designated as *lawrencei*, although it evidently differs widely from the type. As no other specimens of *lawrencei* are at hand, I am unable to judge with accuracy how far this differs from previous examples which have been taken. Judging from descriptions and figures, however, it appears to be much more similar to *H. chrysoptera* than most of those that have been recorded under the name *lawrencei*. It is distinctly grayish about the shoulders, sides of neck, and sides of body. The middle of the belly and posterior underparts are creamy yellowish, leaving only the central part of the breast from the black throat posteriorly clear yellow, and even this is of a more subdued greenish tone than in *H. pinus*. The nape, scapulars, and rump, though largely yellowish green, are partly grayish throughout. The chin and the anterior part of the malar stripes are yellowish, and the feathers of the black throat-patch are slightly tipped with yellow. The wing bars are almost as distinct as in *pinus* but their color is yellow as in *chrysoptera* and the secondaries are broadly edged with greenish. The crown is yellow becoming greenish posteriorly. The only whitish markings are the posterior half of the malar stripe and a short stripe behind the upper border of the eye corresponding to the superciliary stripe which in *chrysoptera* extends nearly or quite to the base of the bill. The lores and auriculars are black, practically as in *chrysoptera*.

Whether or not any special significance attaches to the taking of this bird is problematical. Since *chrysoptera* and *pinus* are known to be hybridizing rather freely in certain parts of their breeding range, it is not strange that specimens of the hybrid type should be forthcoming from a locality in their migration route. Doubtless, it is only because actual collecting has become so limited in the eastern United States, that more specimens of this sort have not been recorded.—WILFRID H. OSGOOD, *U. S. Biological Survey*.

Capture of Lawrence's Warbler on Staten Island, N. Y.—At Richmond, Staten Island, N. Y., on May 11, 1907, I found a Lawrence's Warbler (*Helminthophila lawrencei*) on some dead bushes out in a dry field. Its black throat and cheeks, sharply contrasted with the rich yellow of its breast and crown, rendered it particularly conspicuous among the other warblers present. Fortunately I was able to verify my observation by shooting the bird, which proved to be a male, of typical color, with two white bars on each wing, washed with yellow, and somewhat wider and more confluent than is usual with the Blue-winged Warbler.—JAMES CHAPIN, *New Brighton, N. Y.*

The Breeding of Brewster's Warbler near Boston.—On May 19, 1907, in the Arnold Arboretum, near Boston, Mass., I heard a bird song which I supposed at first was that of a Golden-winged Warbler. Upon investigation, I found the bird on a low birch tree, feeding and singing by turns. To my surprise, though, it had the broad yellow wing-bars, bluish gray back, and yellow crown which I had expected to see, there was only a narrow black line through the eye, and an entire absence of black on the cheeks and throat, the entire under parts being silky pearl-white. Though I was entirely unfamiliar with Brewster's Warbler in life, I had seen stuffed specimens and had read with much interest the latter-day discussions of its relation to Golden-winged and Blue-winged Warblers. A few days later I was allowed to see, through the kindness of Mr. Walter Deane, Mr. Brewster's specimens of all three species, *Helminthophila pinus*, *Helminthophila chrysoptera*, and *Helminthophila leucobronchialis*, among which was the type specimen of *leucobronchialis* taken by Mr. Brewster in Newtonville, Mass., on May 18, 1870. The resemblance between the type specimen and the bird in the Arboretum, as I remembered it, was absolute, except that there was a very slight wash of yellow on the breast of the type specimen which I had not observed on the living bird. Interest in the Arboretum bird quickly spread and it was soon seen by many other observers, all of whom agreed that it was a Brewster's Warbler; the first record for Massachusetts, I understand, since the taking of the type specimen thirty-seven years ago. On June 8, a thorough search of the vicinity was made by several of our more expert local ornithologists, and the female, nest, and five eggs were discovered, the nest being located, I believe, by Mr. C. J. Maynard. The nest is on the ground, at the foot of a tiny elm

tree situated among other low trees and shrubs, and is within six or seven feet of the main driveway through the Arboretum. Across the driveway at this point is a spring and the beginnings of a small brook. In the structure of the nest are interwoven brown leaves with upturned stems, after the fashion of the Blue-winged Warblers as stated in Mr. Chapman's 'Handbook of the Birds of Eastern North America.'

A number of interesting circumstances are to be noted: first, the female has blackish areas on the throat and cheeks, shaped like those on a Golden-wing, but has also a still blacker, narrow line extending through the eye; second, a pair of Golden-winged Warblers has been known to breed in the Arboretum, in the immediate vicinity of the present nest, for a number of years; third, this year the Golden-wings seem to be absent.

Of course the most intense interest centers in the expected young, and it is to be fervently hoped that so accident will befall to prevent the successful hatching of the eggs and rearing of the young birds.—HELEN GRANGER, *Cambridge, Mass.*

Ten Birds New to the Avifauna of Kansas.—Through the kindness of my friend Dr. R. Matthews of Wichita, Kansas, I have received for the Museum of the University of Kansas a mounted adult male specimen of the Black-necked Stilt (*Himantopus mexicanus*). This specimen was shot ten miles south of Wichita in 1906 by Mr. T. H. Griffith.

Dr. Matthews has also presented to the University Museum a specimen of the Red-breasted Merganser (*Merganser serrator*), which was shot in November, 1906, by Mr. Dan Breese on his lake near Colwich, Sedgwick Co., Kansas. This species was included in the early editions of my Catalogue of the Birds of Kansas on the authority of Professor S. F. Baird, but was omitted from the fifth edition, which contained only those species which were personally known to me as occurring in Kansas.

I desire also to note the capture on the Kansas-Colorado line in the spring of 1905, by Mr. Edward R. Warren, of the eight following species new to the Kansas list: The Scaled Partridge (*Callipepla squamata*); the Spurred Towhee (*Pipilo maculatus megalonyx*); the Green-tailed Towhee (*Pipilo chlorurus*); Swainson's Vireo (*Vireo gilvus swainsoni*); Virginia's Warbler (*Helminthophila virginiae*); Macgillivray's Warbler (*Geothlypis macgillivrayi*); the Sage Thrasher (*Oroscoptes montanus*); and the Dwarf Hermit Thrush (*Hylocichla aonalaschke*).

The above ten species, together with the seven species previously reported to 'The Auk,' in addition to the 342 species enumerated in the fifth edition of my Catalogue of the Birds of Kansas, make a total of 359 species whose actual capture in Kansas has been verified by me.—J. H. SNOW, *University of Kansas, Lawrence.*

A Kentucky Warbler near Boston, Massachusetts.—At Wellesley Hills, in the forenoon of May 14, 1907, having just left the electric car and passed in the rear of the stores and dwellings which front on the little village

square, I came to a swampy hollow with some depth of standing water almost surrounded by large willows and with small willows and other brush growth rising out of the water. Here clearly distinguished from familiar warbler songs which at once reached my ear from Parula, Myrtle and Yellow Warblers, Redstart and Northern Water-Thrush was heard a clear, bright, rather loud song in dissyllabic rhythm which I had never heard before. Before coming in sight of the bird which gave it, it was my happy experience to realize that I was looking upon and hearing the song of a Kentucky Warbler (*Oporornis formosa*). The song was many times given at intervals during the half-hour which I remained. There were generally five repetitions of the dissyllable without notes of introduction or finish. It might be put into the word, *wheeter-wheeter-wheeter-wheeter wheeter*, as Mr. Allison suggests in Mr. Chapman's 'Warblers of North America,' or other dissyllables such as others suggest therein, or into the words, *cherry-cherry-cherry-cherry-cherry*, rapidly repeated, as it came to my ear. The fulness and brightness of tone were like the Mourning Warbler's *cheery* song, which, however, is given with more fulness and deliberation and with three repetitions of *cheery* only. Under my observation the Kentucky Warbler moved back and forth in a quite limited area, often about the roots and stems of the bushes just above the water, a very beautifully plumaged bird. Mr. Bradford Torrey's expressions of admiration for the simplicity and richness and good taste of its costume seemed none too enthusiastic.

Passing on from this point the first Blackburnian and Black-throated Blue Warblers of the season were noted, the first Yellow-throated, Blue-headed and Red-eyed Vireos were seen, and the Prairie and Golden-winged Warblers were found in their breeding haunts. The morning of May 14 had opened with light southwest winds and a temperature of 56°, which had been carried in the middle of the forenoon to 78°. It was under these conditions that I found the Kentucky Warbler active and freely singing. Presently a sudden change was inaugurated in five minutes' time, the wind came fresh from the east, and the temperature dropped 20°. This had a quieting effect upon all of the birds, and when I passed on the Kentucky was no longer singing. At four o'clock in the afternoon I returned to this same spot and could not see or hear anything of him. So it was again the next forenoon when I sought him. The other birds of the day before were there, but he was not.

Messrs. Howe and Allen in 'The Birds of Massachusetts,' 1901, do not include the Kentucky Warbler in their list, but in a note make reference to a bird of this species being included in Dr. Holder's 'List of the Birds of Lynn,' 1846, as then in the collection of the Lynn Natural History Society, adding, "as we have been unable to see this specimen we make but this mention of it." Dr. Charles W. Townsend in 'The Birds of Essex County,' 1905, does not include this species in his list, remarking, "Dr. Holder includes this bird in his Lynn list, 1846, stating that there is a specimen in the

collection of the Lynn Natural History Society. As there is no other record of this bird for the State, and as I was unable to find this specimen in a recent examination of the battered remains of this collection, I have omitted the bird from the list."

This Kentucky Warbler at Wellesley Hills would seem, therefore, to be the first authentic record of the species within the State.

In 'A Review of the Birds of Connecticut' by Mr. C. Hart Merriam, 1877, two records of Kentucky Warbler within that State are given, namely: "Mr. Erwin I. Shores obtained a male of this species at Suffield, Conn., Aug. 16, 1876, thus adding another bird, not only to the Avifauna of Connecticut, but also to New England"; and "I learn from Mr. J. G. Ely of Lyme, Conn., that he has shot one Kentucky Warbler." Dr. Jonathan Dwight, Jr., in 'The Auk,' Vol. XX, October, 1903, under the heading, 'Some New Records for Nova Scotia,' based on a small lot of bird skins sent to him from Sable Island by Mr. Jas. McL. Boutcher, furnishes this note on Kentucky Warbler: "A young male taken September 1, 1902, is in first winter plumage as determined by softening the skin and examining the bones. The nearest point at which the species regularly breeds is New Jersey."—HORACE W. WRIGHT, *Boston, Mass.*

Many Eyes are Better than One Pair.—Ornithologists from all over the United States and Canada are sending each year to the Bureau of Biological Survey their observations on the arrival of the birds. Some of these reports are merely incidental notes taken while performing the daily routine tasks; others represent a large amount of time and frequent special trips taken to fields and woods. The question continually arises, How nearly do the better grade of these reports represent the actual date of the earliest arrivals? If more time was spent in the fields by the observer, or if several persons worked carefully and completely a limited locality, how much earlier would be the dates of arrival? To find an answer to these questions was the problem before me the past spring. I began my excursions with the opening of the season, and as spring advanced, my trips became more frequent until during the three weeks of the height of migration they were almost daily. They were extended in all directions around Washington and were planned to cover the various kinds of country. As a result I saw more different species of birds than during any previous spring, including several of the rarest birds of this region.

The Audubon Society of the District of Columbia is in a flourishing condition. It holds several field meetings each year; the members have had access to a good selection of skins of local species and many of the members have become well acquainted with the avifauna of the District. In addition to the regular field days of the Society, this spring several of the more expert bird observers made many extra trips into the woods, and some of the most enthusiastic spent a large part of their time in hunting for new arrivals. These all reported to me the new birds they saw

from day to day, and I also received the notes collected by the various members of the Biological Survey and the National Museum in their excursions around the city. Many of the notes were duplicates or of no value, but after all these had been eliminated it was found that usable records had been received from twenty-three persons. The question then is how much additional did the twenty-three pairs of eyes observe that had not been noted by me. The following is a condensed answer.

Seen by others and not by me	4 species
Seen by me and not reported by others	3 "
Seen by others before I saw them	44 "
Seen by me before reported by others	25 "
Seen by both on the same day	7 "

Total	83 species
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The comparison applies only to the migrant land birds, as the facilities for observing water birds in the district are too limited to make the records of any value.

When using migration records for the calculation of average dates of arrival, I usually discard dates that are more than six days later than the probable normal date of arrival. When this test is applied to the notes the following results are obtained

Seen by others within six days of normal, but not by me	12 species
Seen by me within six days of normal but not reported by others	11 "
Seen by both within six days of normal	46 "
Reported by no one within six days of normal	14 "

Total,	83 species
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This last item of fourteen species not recorded within six days of normal is probably higher than would be obtained during most years. The month of April, 1907, in Washington was the coldest for thirty-five years, and many species were retarded in their movements. As the record stands in this unfavorable season I obtained usable notes on 71 per cent. of the species seen, while by adding the notes of the other observers, this is raised to 84 per cent. Of the 79 species seen by me, 57 were noted within six days of the normal time of arrival, which number is raised to 69 species on the addition of the remainder of the records.

The most interesting part of the investigation is the question of how much earlier twenty-four pairs of eyes can see birds than one pair. In spite of all my efforts, the larger amount of time spent in the field and the great variety of country covered, more than half the species were reported to me by others before I had noted their arrival.

Yet I saw them soon afterward and the 25 species that I saw first are a partial offset. The net result is that the combined notes average 1.3 days earlier than my notes alone. Hence, judging by the results of this single

year's trial, the dates of arrival obtained by a single person are on the average a little more than a day later than the time the birds actually did arrive.—WELLS W. COOKE, *Biological Survey, Washington, D. C.*

Some Interesting Records from southern Missouri.—*Helminthophila bachmani*. BACHMAN'S WARBLER.—I was fortunate enough to find this interesting warbler on two different occasions, the first on May 2, 1907, in the northwestern part of Shannon County, and the second on May 23, 1907, in Carter County, near Grandin. Both of these records were surprising considering the character of the country, for these counties lie on the southeastern slope of the Ozark Mountains, a dry rocky region of limestone formation covered with a forest of oak and yellow pine (*Pinus echinata*), and not at all like the swampy cypress swamps of Dunklin County in the Missouri Peninsula where Mr. O. Widmann found them in 1897 (Auk, XIV, p. 305).

***Helminthophila leucobronchialis*.** BREWSTER'S WARBLER.—On May 12th, 1907, in Shannon County, Mo., my attention was attracted by a warbler song which I did not recognize. I soon discovered the bird and on securing it found it to be an absolutely typical specimen of Brewster's Warbler (No. 1531, ♂, Coll. L. B. & E. S. Woodruff). The entire under parts are pure white without even a suggestion of any yellow wash. The entire back and neck, from crown down, bluish gray with only a few feathers in the middle of the back slightly tipped with greenish, not nearly so much as usually found in *H. chrysoptera*. On the wings is a single broad patch of canary yellow. In fact this specimen, except for the absence of the black throat and cheek patch, would be a typical *H. chrysoptera*, and the only similarity to *H. pinus* is the narrow black line through the eye. There is nothing about this specimen to substantiate the theory that Brewster's Warbler may be a color phase of *H. pinus*. The song, though similar in character to that of *H. pinus*, was much weaker and more varied.

This makes the first record for Missouri and for any State west of the Mississippi River.

***Helminthophila peregrina*.** TENNESSEE WARBLER.—On May 2, 1907, I secured a male Tennessee Warbler in Shannon County, Mo., which had a number of coppery chestnut feathers in its crown, similar to those of a Nashville Warbler. In all other respects it was a typical Tennessee Warbler. (No. 1500, ♂, Coll. of L. B. & E. S. Woodruff.)

***Dendroica vigosii*.** PINE WARBLER.—This warbler has not been heretofore recorded as breeding in Missouri but I found it common in the pine woods of both Shannon and Carter Counties from March 8 till I left on June 8. Though I found no nests, I saw the birds gathering nesting material and carrying it up into pines in the latter part of March, and on April 25, I secured a nestling too young to fly which had fallen from its nest and was being fed on the ground by its parents. I also found a number of full grown young birds in the first plumage before the middle of May.

Dryobates borealis. RED-COCKADED WOODPECKER.—This woodpecker is also a bird which has not been recorded as breeding in Missouri. Unfortunately I found no nests but of its breeding there there can be no question for I found it fairly common in Shannon County and in those portions of Carter County where the pine has not yet been lumbered from early in March till the middle of June. On May 12, 1907, I secured a male in Shannon County, whose breast and belly showed that he had been sharing with his mate in the duties of incubation.

Empidonax traillii alnorum. TRAILL'S FLYCATCHER.—This flycatcher, though recorded from the Mississippi Valley both north and south of Missouri, has not previously been found in Missouri. On June 3, 1907, I saw a pair of these birds near Grandin, Carter County, Mo., and secured the female. Dr. J. A. Allen confirmed my identification of this species.

Loxia leucoptera. WHITE-WINGED CROSSBILL.—On April 18, 1907, I secured a female White-winged Crossbill which was feeding in company with two female American Crossbills in the top of a fallen yellow pine. This makes the first record for Missouri.

Peucæa æstivalis bachmanii. BACHMAN'S SPARROW.—This bird also has not been heretofore recorded as breeding in Missouri, but I found it common throughout the virgin mixed pine and oak forests of Shannon County from April 6 till I left on May 15 for Grandin, Carter County. In Carter County the pine had been mostly cut off and the Bachman's Sparrow was rather rare, but on May 27, 1907, I secured a nest containing two eggs of Bachman's Sparrow and three eggs of the Cowbird, all with incubation far advanced.

Sitta pusilla. BROWN-HEADED NUTHATCH.—Though I found no proof of the breeding of the Brown-headed Nuthatch in Missouri, the probabilities are strongly in favor of it. On March 19, 1907, I secured a pair of these birds together in some yellow pines on the edge of a small clearing in Shannon County. The female was flying back and forth to an old dead pine and seemed to be much disturbed after I had secured the male.—E. SEYMOUR WOODRUFF, *New York, N. Y.*

Audubon's Ornithological Biography.—In the January 'Auk' (XXIV, p. 111) Mr. Ruthven Deane, of Chicago, speaks of a copy of Vol. I, of Audubon's Ornithological Biography, bearing the imprint, "Philadelphia: Judah Dobson, Agent, 108 Chestnut Street; and H. H. Porter, Literary Rooms, 121 Chestnut Street, MDCCCXXXI"; and says that after careful search he has only recently found a similar copy.

I beg to say that in the library of the Academy of Natural Sciences, (Philadelphia) the first volume has the same imprint. The other four volumes have, each, the imprint, "Edinburgh, Adam & Charles Black," with the years 1834, 1835, 1838, and 1839, respectively. All but Volume II were presented to the Academy by the author. My own Volume II bears the imprint "Boston, Hilliard, Gray & Company, 1835."

I have two duplicates of volume III, Adam & Charles Black, which I would sell or exchange for Volumes I and IV.—NATH. E. JANNEY, *Philadelphia, Pa.*

RECENT LITERATURE.

Salvin and Godman's '*Biologia Centrali-Americana. — Aves.*'— This great work on the birds of Middle America,¹ which was completed some little time ago, forms four quarto volumes, three of text, aggregating 1680 pages, and one of 84 hand-colored plates. The publication was begun in 1879 and completed in 1904, having been much delayed by Mr. Salvin's long-continued ill-health and sudden death in 1898, the third volume of the text being completed by Mr. Godman, with the assistance of Dr. R. Bowdler Sharpe and Mr. Ogilvie-Grant.

The region embraced in this work includes Mexico (except Lower California), and Central America south to a little beyond the political boundary of Panama, and the adjacent islands. "The 1413 species of birds . . . embrace representatives of 78 families and 539 genera." Of the genera, 38 are endemic, as are also 636 of the species. "Of these latter, 271 are peculiar to (a) Mexico, Honduras, or Guatemala, 3 to (b) Nicaragua, and 161 to (c) Costa Rica or Panama, the remainder (189) being more widely distributed within the region or common to two of these divisions." In comparison with other tropical regions, India has 1626 species against 1413 for Middle America, but the Indian region is twice larger in area, "so that the balance of numbers is considerably in favor of Central America."²

The material for this work was mainly obtained by the authors on their several visits to Central America and Mexico in 1857–58, 1861–63, 1867, 1873–74, and 1887–88. In addition to their own field explorations, they employed several skilled collectors for a number of years, who made large collections in various parts of Mexico, Guatemala, Costa Rica and Panama. As the various parts of the work were completed the authors presented their material to the National Museum at South Kensington, amounting in the aggregate to "about 85,000 specimens."

The '*Biologia Centrali-Americana*' was an enormous undertaking, its scope comprising the fauna and flora of an immense region. Its publication, begun nearly thirty years ago, has proceeded with reasonable rapidity, till now only a few of the forty or more volumes — those relating to fishes and certain groups of *Cœlenterates* — remaining unfinished. It has, quite naturally, greatly exceeded the estimate given in the early pros-

¹ *Biologia Centrali-Americana.* | — | *Aves.* [Vol. I [–III] (Text.) [Vol. IV. Plates.]] By | Osbert Salvin, F. R. S., &c., | and | Frederick DuCane Godman, D. C. L., F. R. S., &c. | 1879–1904.— 4 vols. 4to, 3 of text and 1 of plates.

Vol. I, pp. i–xliv, November, 1904; pp. 1–512, pll. col. i–xxxv + xva, September, 1879–April, 1887. Vol. II, pp. i–iv, 1–598, pll. xxxvi–lx + liva, lviii, lviii, lixa, December, 1888–February, 1897. Vol. III, pp. i–iv, 1–510, pll. lxi–lxxix, November, 1897–April, 1904. Vol. IV, pp. i–viii, with plates as per collation above.

² Introduction, by Mr. Godman, pp. vi–viii.

pectuses, it comprising some 20,000 pages of text, and about 1500 plates, many of them colored. The different parts having been prepared by eminent specialists, it is in the highest degree authoritative, and forms an enduring monument to the enterprise, ability, and persistence of its editors and projectors, Messrs. F. DuCane Godman and Osbert Salvin. As a notice of the general scope and plan of the work has already been given in this journal,¹ and also an extended review of Volume I of the 'Aves,'² it remains to notice here the concluding bird volumes.

Mr. Robert Ridgway, in reviewing the first volume of the 'Aves' (*l. c.*), said of it: "Volume I . . . includes the whole of the Oscines, and is the only single and approximately complete work in existence [in 1890] on the special subject to which it pertains. The high reputation of the authors is of itself a sufficient guarantee that their task has been intelligently and thoroughly performed, and has resulted in a grand work which is absolutely indispensable to students of New World ornithology, highly useful to those who labor in other geographical fields, and must long remain the standard authority on the birds of Central America." This high praise applies in equal force to the succeeding volumes, as do also Mr. Ridgway's criticisms of some of its defects. Thus, he says: "As was to be expected from the character of their previous writings on the same subject, the authors of the 'Biologia' treat their subject from the conservative standpoint to which English naturalists, for the most part, still adhere; and it is the natural sequence of this method, but more especially the unfortunate adoption of the purely binomial system of nomenclature which affords most of the grounds for criticism; the very great importance of the work rendering such defects highly conspicuous." In other words, when the binomial system is strictly followed, it inevitably leads to inconsistent rulings in regard to the status of forms commonly recognized as subspecies, some being given full specific rank and others, equally entitled to recognition, being reduced to synonyms.

Volume II includes the suborders Oligomyodæ and Tracheophonæ of the Passeres, the Macrochires, Cypseli, Caprimulgi, Pici, Coccyges, and Psittaci; Vol. III, the Striges, Accipitres, Steganopodes, Herodiones, Phœnicopteri, Anseres, Columbæ, Gallinæ, Geranomorphæ, Limicolæ, Gaviæ, Tubinares, Pygopodes, Alcæ, and Crypturi; Vol. IV consists of 84 hand-colored plates, representing 150 previously unfigured birds, drawn by J. G. Keulemans, with the explanatory 'List of the Plates.'

The classification adopted is that of Selater and Salvin's 'Nomenclator Avium Neotropicalium,' published in 1873. In the matter of nomenclature, the 1766 edition of Linnæus's 'Systema Naturæ' is taken as the date of departure, and the binomial system is strictly adhered to throughout, subspecies, as such, not being recognized, with, as already noted, many

¹ Bull. Nuttall Orn. Club, VI, 1881, pp. 174, 175.

² Auk, VII, 1890, pp. 189-195, by R. Ridgway.

inconsistent rulings as to forms admitted or rejected. It is to be remembered, however, that the work was begun before subspecies had obtained general recognition, and before the 1758 edition of Linnæus had come to be so generally recognized as the proper date for the beginning of zoological nomenclature.

The method of treatment is briefly as follows: The principal bibliographical references and synonymy are cited for the species and genera; the distinctive characteristics of the genera are given, with a general statement respecting the number and distribution of the species; a Latin diagnosis or description is given of each species, followed by a brief statement of its distribution, and remarks on the general history of the species, its affinities and distinctive features, its geographical distribution, and often more or less is said about its haunts and habits, based largely on original field observations. The 'Introduction' (Vol. I, pp. v-xliv) gives a general history of the work; the limits of the region treated; the material on which the work is based and how and where it was collected; the faunal relations and characteristics of the region; a list of Mr. Salvin's more important papers on the birds of Central America; and tables of distribution for the families and species of the birds of Mexico and Central America (pp. xi-xxxvii).

While later works on the avifauna of the region here treated may supercede the 'Aves' of the 'Biologia,' from the points of view of nomenclature and classification, it will ever remain a classic in the ornithological literature of 'Middle America,' and an enduring monument to its authors.—J. A. A.

Proceedings of the Fourth International Ornithological Congress.¹—The Proceedings of the Fourth International Congress, held in London, June, 1905, forms a volume of nearly 700 pages, illustrated with eighteen plates, seven of them colored. A 'Record of Proceedings,' occupying pp. 9-89, is followed by the President's Address, by Dr. R. Bowdler Sharpe, and thirty-eight papers read before the Congress. The 'Record of Proceedings' is not only a record of the meetings and excursions, but includes a summary of the discussions on the papers read.

The President's address (pp. 90-143) is an account of the origin and history of the Bird Collection in the British Museum. This is followed by a paper on 'What constitutes a Museum Collection of Birds?' (pp. 144-156), by Frank M. Chapman. This is practically an account of the orni-

¹ Proceedings | of the | Fourth International | Ornithological Congress | London June, 1905 | forming | Volume XIV of the "Ornis" | Edited | under the direction of the President: | R. Bowdler Sharpe, LL. D., | by | The Secretaries: | Ernest J. O. Hartert, Ph.D., and J. Lewis Bonhote, M. A. | With Eighteen Plates. | London: | Dulau & Co., | 37, Soho Square, W. | February, 1907. Large 8vo, pp. 1-696, pll. i-xviii, 7 colored. February, 1907.

ological department of the American Museum of Natural History. Several full-page half-tones illustrate the method of storage of the research collections, several of the larger bird groups, and one of the Museum's travelling 'School Collections.'

Little more can be given in this connection than the titles of the papers, which indicate the varied character of the subjects brought before the Congress, as follows: 'The Ornithological Correspondence of the late Professor Johann Friedrich Naumann, by Paul Leverkühn; 'On the Migration of Birds,' by Otto Herman; 'Sur un atlas des Planches coloriées de l' Ornithologie de Brisson attribué au peintre Martinet, provenant de la vente Alph. Milne-Edwards,' by Dr. Louis Bureau, followed by remarks by Alfred Newton; 'The First Bird List of Eber and Peucer (1549), and its Relation to the "Avium... Historia" of William Turner (1544),' by Henry Scherren; 'On Extinct and Vanishing Birds,' by Hon. Walter Rothschild (with 2 colored plates); 'Kaiseradler und Aasgeier am Horst,' by Paul Leverkühn; 'On some Antarctic Birds,' by Edward A. Wilson; 'Some Notes on the Hybridizing of Ducks,' by J. Lewis Bonhote (with 4 colored plates); 'The principal aims of Modern Ornithology,' by Ernest Hartert; "Some ornithological results of the Scottish National Antarctic Expedition,' by W. S. Bruce; 'Vortheile und Nachtheile moderner Arten- und Unterartenbeschreibung und Nannengebung,' by Rudolf Blasius; 'Monographie de la Sterne de Dougall (*Sterna dougalli*),' by Dr. Louis Bureau (with map); 'Descriptions of new species and conspecies of Neotropical Birds,' by Hans Graf von Berlepsch (see below, p. 361); 'On the genus *Elania* Sundev.,' by Hans Graf von Berlepsch (see below, p. 362); 'On the Birds of Madeira,' by Ernesto Schmitz; 'On the origin of the differences between Nestling Birds,' by W. P. Pyraft; 'Schlussstein zur Litteratur über *Erithacus cairei*,' by Hans Freiherr von Berlepsch, 'Studien über Tyranniden,' by Hans Graf von Berlepsch (see below, p. 362); 'La Perdrix grise des Pyrénées,' by Louis Bureau; 'Sequence in Moults and Plumages, with an explanation of Plumage-Cycles,' by Jonathan Dwight, Jr.; 'Remarques au sujet de certains oiseaux méconnus,' by Alphonse Dubois; 'On Variations in the Colouring of *Colymbus cristatus*, *C. griseigena*, and *C. nigricollis*, observed at the Lake of Velence, in Hungary,' by Steven Chernel de Chernelháza; 'The Unusual Migration of Brännich's Murre (*Uria lomvia*) in Eastern North America,' by J. H. Fleming (see below, p. 359); 'Neuere Beobachtungen über den Herbstzug des Stares (*Sturnus vulgaris*),' by F. Helm; 'Die Pyrenäen und ihre Vogelwelt,' by R. Blasius; 'On Colour Variation in the Eggs of Palearctic Birds,' by F. C. R. Jourdain; 'The Wild Birds Protection Acts as administered by Orders in Great Britain and Ireland,' by Sir Digby Pigot; 'Bird Legislation in Australia,' by Sir John Cockburn; 'The Rationale of Bird Protection,' by Frank E. Lemon; 'The Food of Birds,' by Otto Herman; 'Ornithologie économique. A propos d' études sur le Régime alimentaire des Oiseaux,' by Dr. Quinet; 'Note sur le Freux (*Corvus frugilegus* L.)

et son utilité au point de vue de l' Agriculture et de la Sylviculture,' by Fd. Visart de Bocarmé; 'The Sparrow! Is it useful or harmful to Agriculture?' by Igali Svetozár; 'Étude sur la grosseur des grêlons dangereux pour les Oiseaux,' by Paul Martin; 'Notice sur l'opportunité de protéger la becasse au printemps,' by Louis Ternier; 'The Importance of Aviculture as an Aid to the Study of Ornithology,' by D. Seth-Smith.

In the account of the meeting held at Cambridge is an interesting list of books, letters, papers, and drawings exhibited in the Philosophical Library, with notes thereon by Professor Newton.—J. A. A.

Newton's 'Ootheca Wolleyana.'—The fourth and concluding part¹ of the 'Ootheca' comprises lots 4841-5918, in sequence, with Nos. 5919-6076 in a 'Supplement' of 'Corrections, Omissions, and Additions.' The nature of the work and the admirable manner of treatment having been previously stated,² it remains to record its completion and to note the matter in the 'Appendix,' which consist of a reprint of all the natural history publications of John Wolley, in chronological sequence, except the large amount of ornithological matter given *passim* in the 'Ootheca.' These papers are 56 in number, of which 14 relate to mammals, 26 to birds, 10 to reptiles and amphibians, 9 to insects, and 2 to 'miscellaneous,' and bear dates, 1845-1859.

Says the editor, in a 'Retrospective Note': "Thankful as I am at being able to complete this work, my feeling is rather of regret than satisfaction, for, owing to the length of time which has elapsed since the first part of it appeared, so few of Mr. Wolley's personal friends are left to see its conclusion, and this Catalogue is largely a record of ancient friendships. My only consolation is that the protracted delay has not been my own fault, as I can honestly say that whenever the cessation of more important duties gave me opportunity I resumed my labor of love, but again and again months—not to say, years—passed without such opportunity recurring. Furthermore, I may repeat, as I pointed out in the Introduction (Vol. I, p. iii), that the delay has not been without its advantages, by enabling me to make considerable additions to the Collection of great value and interest—many of them specimens wholly unattainable in

¹ Ootheca Wolleyana: | An illustrated Catalogue | of | the Collection of Birds' Eggs | formed by the late John Wolley, Jun., M. A., F. Z. S. | Edited from the original notes | by | Alfred Newton. | — | Part IV. | Alcæ-Anseres: | with Supplement and Appendix, | — | London: | R. H. Porter, 7 Prince's Street, Cavendish Square. | M. CM. VII. | [Price £1 5s. net.]—Svo, pp. i-iv, 385-665 + 1-96, i-vi, 3 pl. and map.

Title-page of the completed Volume II: Ootheca Wolleyana: | An illustrated Catalogue | of | the Collection of Birds' Eggs, | begun by the late | John Wolley, Jun., M. A., F. Z. S., | and continued with additions | by the Editor | Alfred Newton. | — | Vol. II. | — | London: | M. CM. V.-M. CM. VII. | [Sold by R. H. Porter, 7 Prince's Street, Cavendish Square.]

² For notice of Part III, see Auk, XXIII, Jan., 1906, p. 118.

Mr. Wolley's lifetime and for long after his death. . . . Lastly, I have to state that the Collection of which this is the Catalogue has been given to the University of Cambridge, in whose Museum of Zoölogy I trust it may long continue."

The frontispiece gives a view of Muoniovara, Mr. Wolley's headquarters in Lapland, from a pencil drawing by Mr. Wolley made in the autumn of 1853. A map of part of Lapland illustrates the ornithological journeys of Mr. Wolley in 1853-1857. The 'Catalogue,' it is almost needless to say, is a mine of previously unpublished first-hand information respecting the breeding haunts and habits of many northern-breeding water-fowl and other species; while the extended editorial additions and comment greatly increase the interest and value of the work.¹—J. A. A.

Mershon's 'The Passenger Pigeon.'²—In compiling his book on the Passenger Pigeon Mr. Mershon has done good service. Its contents is varied and of unequal value, but as a whole it is a convenient and valuable record of the former almost incredible abundance of a now nearly extinct species. Much of the material here brought together has never before been published, and much of the remainder is from such scattered sources that it is a great convenience to have it thus brought together in a single handy volume. The author modestly disclaims any previous literary training, and says: "I am merely a business man who is interested in the Passenger Pigeon because he loves the outdoors and its wild things, and sincerely regrets the cruel extinction of one of the most interesting natural phenomena of his own country. If I have been able to make a compilation that otherwise would not have been available for the interested reader, I need make no further apologies for the imperfect manner of my treatment of this subject." The treatment is, naturally, far from exhaustive, the details relating mainly to southern Michigan, but a wide circle of readers will be grateful for the large amount of new and first-hand information here brought together. The matter follows in logical sequence, and a few errors in personal names, and a little indistinctness here and there in setting off the parts of the narrative derived from different sources, can be easily pardoned. An index, however, would have been of great service.

The work is divided into nineteen chapters, with captions indicative of their contents. The first, entitled 'My Boyhood among the Pigeons,' is delightfully reminiscent of the author's own early experiences with pigeons in southern Michigan. The second and third chapters are reprints

¹ Since these lines were written the sad news has been received of Professor Newton's death. See below, under 'Notes and News.'

² The | Passenger Pigeon | By | W. B. Mershon | [Seal] New York | The Outing Publishing Company | 1907 — 8vo, pp. xii + 225, 3 colored and 6 half-tone plates. (Price, \$3.00 net.)

of Alexander Wilson's and Audubon's accounts of the Passenger Pigeon, with a colored reproduction of Audubon's plate. These form so important a part of the early history of the subject that their entire republication is far more satisfactory than could have been any attempt at excerpting or paraphrasing. Then follows, as Chapter IV, 'As James Fennimore Cooper Saw It,' consisting of pertinent and graphic extracts from 'The Pioneers' and 'The Chainbearer,' relating to the pigeon as seen in early days in central New York. Chapter V is Chief Pokagon's account, published in 'The Chautauquan' in November, 1895 (Vol. XXII, No. 20), and relates to pigeons as seen by him in Ohio and Indiana as well as in Michigan. This is followed by a transcript of the late Major Bendire's account of this species given in his 'Life Histories of North American Birds' (1892). This includes the greater of Mr. Brewster's article on the pigeon published in 'The Auk' (VI, Oct. 1889, pp. 285-291), and the omitted parts are given in Mr. Merston's Chapter VII, 'Netting Pigeons.' Thus is copied entire, in Chapters II-VII (pp. 9-76) the greater part of the standard literature relating to the natural history of the Passenger Pigeon. Chapters VIII-XI (pp. 77-140) chronicle its slaughter, beginning with Prof. H. B. Roney's paper in the 'American Field' (of Jan. 11, 1879), and the counter-statement by E. T. Martin in a circular issued later in the same year, followed by statements from correspondents who, as former shippers of pigeons, and thus conversant with the statistics and methods of pigeon slaughter, give valuable data here for the first time published.

Chapter XII, 'The last of the Pigeons,' consists of a series of notes from 'The Auk' (1895-1898), contributed by Ruthven Deane, and of various communications to the author not before published. Chapter XIII, 'What Became of the Wild Pigeon,' is an article contributed by Sullivan Cook to 'Forest and Stream' in 1903, who states, among other things, that for forty days, during one season, three car loads of pigeons a day were sent to eastern cities from a single shipping point in Michigan, or a daily shipment of nearly 25,000 dozen, or a total of 1,000,000 birds; and that in three years 990,000 dozen, or about 11,000,000, were caught and shipped east from the northern part of the southern peninsula of Michigan. He says: "And when you are asked what has become of the wild pigeons, figure up the shipping bills, and they will show what has become of this, the grandest game bird that ever cleft the air of any continent."

Various theories of the disappearance of the wild pigeons having been put forth, these are recited, Chapter XIV being a communication from C. H. Ames, who advocates the hypothesis that they must have been destroyed by natural agencies, perhaps by being drowned in the Gulf of Mexico while migrating across it, or by other similar catastrophies elsewhere. Comment on this theory was secured by the author from Mr. Ridgway, who says: "Nothing in the history of the Passenger Pigeon is more certainly known than the fact that its range to the southward *did not extend beyond the United States*. . . . The range of the Passenger

Pigeon was limited to the mixed hardwood forest region of the eastern United States and Canada, and any that occurred beyond were stragglers, pure and simple."

Subsequent chapters bring down the record to date of stragglers seen, or supposed to have been seen, in various parts of the country, east as well as west; and Mr. Deane's paper on the Passenger Pigeon in confinement is republished from 'The Auk' (XIII, 1896, pp. 234-237, together with letters from Professor C. O. Whitman on the same subject.

The work has as a frontispiece a colored plate of the Passenger Pigeon, drawn by L. A. Fuertes; a reproduction in color of Audubon's plate of this bird; two half-tone plates of the Passenger Pigeon and Mourning Dove, showing both species side by side photographed to the same scale; a colored plate of the Band-tailed Pigeon, by Allan Brooks, for comparison with the Passenger Pigeon; and other pertinent illustrations of interest.

Although Mr. Merston nowhere gives a summary of the evidence respecting the practical disappearance of the Wild Pigeon, he expresses himself as "satisfied that the destruction of the pigeons was wrought to gratify the avarice and love of gain of a few men who slaughtered them until they were virtually exterminated" (p. 163, footnote).—J. A. A.

Fleming on the Disappearance of the Passenger Pigeon.¹—The capture of single birds from 1887 to 1893 is mentioned, as also the shipment in 1892 and 1893 of several hundred dozen each year from the Indian Territory to New York and Boston, these being "the last records we have of the Passenger Pigeon as anything more than a casual migrant. The records ceased after this till 1898 when three were taken at points widely apart. . . . For all practical purposes the close of the nineteenth century saw the final extinction of the Passenger Pigeon in a wild state." He states that none of the "persistent rumours of the return of pigeons. . . . has borne investigation."—J. A. A.

Report on the Immigration of Birds in England and Wales in the Spring of 1906.—The second Report of the Committee appointed by the British Ornithologists' Club on the spring migration of birds into England and Wales² conforms in plan and general character with the Report for 1905, fully described in a previous number of this Journal.³ Thirty-four species—five additional to those reported upon for the spring of 1905—are specially treated, a résumé of the dates and manner of arrival for each

¹ The Disappearance of the Passenger Pigeon. By James H. Fleming. Ottawa Naturalist, Vol. XX, pp. 236, 237, March 22, 1907.

² Report on the Immigration of Summer Residents in the Spring of 1906. By the Committee appointed by the British Ornithologists' Club. 8vo, pp. 189, April, 1907. = Bulletin British Orn. Club, Vol. XX.

³ Auk, XXIII, Oct. 1906, p. 472.

being separately given, followed by a chronological summary of the records, and a map on which are plotted the places and dates of arrival. An introduction of 28 pages states the method and purpose of the work, and gives a tabular presentation of the weather conditions and the arrival records. At the end of the Report is a summary of the records of some 40 'unscheduled birds,' or species with too few records to treat formally, and a list of the observers and lighthouses from whom observations were received, and a map showing the points at which the observations were made.

A few of the general statements made in the 'Introductory' are to the effect that the "west of England was in many cases populated before the east and southeast." "A well-defined route, followed by various streams of immigrants, passes due north from Devon, through Wales and the western counties of Scotland. In the case of some species, which arrived along the whole of the south coast, the direction of flight was due north, but their western flank was invariably in advance of the eastern." Some other species held a northwesterly course, and a few others a northeasterly course. It is the purpose of the Committee to continue these observations and reports for several years, reserving generalizations till much more information has been gathered. The Committee for 1906 consisted of F. G. Penrose, chairman, C. B. Rickett, C. B. Ticehurst, N. F. Ticehurst, and J. L. Bonhote, secretary.—J. A. A.

Forbes's 'An Ornithological Cross-section of Illinois in Autumn.'—This novel contribution to ecology gives the results of observations made by Messrs. A. O. Gross and H. A. Ray, on a trip across the State of Illinois from Danville to Quincy, August 28 to October 17, 1906, under the direction of Professor Forbes, who here¹ summarizes the results. The strip surveyed was 150 feet in width for the whole distance of 192 miles, or an area of five and a half square miles. The total number of birds observed, and recorded with reference to their mode of occurrence, as whether in corn, wheat, stubble, or plowed fields, meadows, orchards, pasture lands, swamps, etc., was 4804, representing 93 species. Of this total number 1620, or about one third, were English Sparrows; 90 per cent. of the birds seen belonged to 20 species, and 85 per cent. to 15 species. Eliminating the English Sparrow from consideration, the number of individuals seen for 18 species ranged, respectively from 57 for the Blue Jay to 517 for the Crow Blackbird.

Besides the discussion of the observations, the data are conveniently presented in 12 tables, and the paper closes with a tabular list of all the species observed; the route is divided into six sections, thus giving approximately the dates and localities where the birds were seen, as well as the number for each section.

¹ An Ornithological Cross-section of Illinois in Autumn. By S. A. Forbes. Bull. Illinois State Laboratory of Nat. Hist., Vol. VII, April, 1907, pp. 305-335.

The list is interesting from several points of view; as the period of observation included the most important portion of the fall migration, it is not surprising to note that many of the summer residents and early migrants were met with only during the first part of the journey, and the later migrants only toward its close. Only 13 individuals are recorded for the whole family Tyrannidæ, of which six are Phœbes and three are Kingbirds — two of the latter for the last three days of August, and the other for October 12–17! A Rough-legged Hawk is entered as seen the last of August; only one Chipping Sparrow is recorded, for the period Sept. 17–21; also one each for the Red-eyed, Philadelphia and Solitary Vireos, one Yellowthroat and one Mockingbird. The Song, Swamp and Lincoln's Sparrows were not noted till October. There is brief reference to a later trip made by the same observers, from Cairo twelve and a half miles northward, with very different results as to the prevailing species represented, while the number of individual birds to the square mile showed an increase of from 874 to 5882.

Says the author: "Definite conclusions of permanent value concerning the numbers and significance of the bird life of the State evidently cannot be drawn until many such pictures as these have been assembled, compared, and adjusted in their right relations; and it has been the principal object of this paper to describe and illustrate one process, at least, by which the materials necessary to a correct general view of the ornithological ecology of the State may be brought together and made available."—J. A. A.

Bangs on the Wood Rails.— Only the species occurring north of Panama¹ are here treated, namely *Aramides axillaris*, *A. cajanea*, *A. albiventris*, *A. a. mexicanus*, and *A. a. plumbeicollis*. Following a 'key' to the five forms, each is described in detail, including tables of measurements, with a discussion of its relationships and geographical distribution. *A. a. mexicanus* is here first described, it differing from true *albiventris* in darker colors throughout.—J. A. A.

Berlepsch on New Neotropical Birds.²— Of the thirty 'new' forms here described (17 species and 13 subspecies), seven had previously been named and briefly described in Vol. XVI of the Bulletin B. O. C., in May, 1906. *Idioptilon* is a new genus of Tyrannidæ (type, *I. rothschildi* sp. nov.), and a third of the new species and subspecies belong also to this family. About half of these new forms are from Argentina and Bolivia, and the others mostly from Brazil, Ecuador, and Colombia.—J. A. A.

¹ On the Wood Rails, Genus *Aramides*, occurring North of Panama. By Outram Bangs. American Naturalist, Vol. XLI, March, 1907, pp. 177–187.

² Descriptions of New Species and Subspecies of Neotropical Birds. By Hans Graf von Berlepsch. Proc. IVth Internat. Orn. Congress, 1905 (1906), pp. 347–371.

Berlepsch on the Tyrannidae.¹—As is well known, Count von Berlepsch has long given special attention to this difficult family of birds, and here presents his latest conclusions respecting the relationships and status of the genera usually referred to it, and gives his opinion respecting the status and proper nomenclature of a considerable number of the species. He divides the family into seven subfamilies, of which three are new, as follows: (1) Tanipterinae, with 22 genera; (2) Tyranninae, with 10 genera; Myiarchinae, subf. nov., with 13 genera; (4) Rhynchocyclinae, subf. nov., with 4 genera; (5) Platyrhynchinae, with 22 genera; (6) Serpophaginae, subf. nov., with 5 genera; (7) Elaniaeinae, with 12 genera. Several new species and subspecies are proposed, and the following new genera: (1) *Xanthomyias*, type *Muscicapa virescens* Temm.; (2) *Oreomyias*, type *Pogonotriccus plumbeiceps* Lawr. The heretofore current generic position of a large number of species is here changed.—J. A. A.

Berlepsch on the Genus *Elania*.²—Forty-nine forms of this genus (*Mynopagis* is merged with true *Elania*) are here recognized—31 species and 18 additional subspecies, or 12 more than were listed by Sharpe in 1901. Two species and six subspecies are described as new. The preliminary matter includes comment on the affinities of the genus, its geographical distribution, habits of the species, nesting and eggs, and an extended résumé of the literature, but not a word on the seasonal variation in color, so striking in many of the forms, shown not only in freshly moulted birds as compared with birds in the faded breeding plumage, not only in specimens from the same locality but in individual moulting birds in which both plumages may frequently be seen. Neither is anything said of the wide range of individual variation in the size and shape of the bill, and in general size, nor of the varying amount of concealed white in the crest, which is often absent in some forms in the younger birds. Yet many forms here recognized seem to rest on just such differences. Sixteen years ago, when the present reviewer had something to say on some of the species and subspecies of this group, the fashion of fine splitting had not nearly reached its present stage of refinement, and many forms then synonymized we should now freely recognize, but not, we fear to the same extent as in the able and very valuable monograph here under notice. The amount of seasonal and individual differentiation unquestionably evident in every large series from any single locality should inspire caution when it comes to the naming of new forms from single specimens.

This valuable monograph gives careful descriptions of all the forms recognized, full bibliographies of each, and a list of the localities from

¹ Studien über Tyranniden. Von Hans Graf Berlepsch. Proc. IVth Internat. Orn. Congress, 1905, (1906), pp. 463-493.

² On the Genus *Elania* Sundev. By Hans Graf von Berlepsch. Proc. IVth Internat. Orn. Congress, 1905 (1906), pp. 372-448.

which specimens have been reported; also a key for the determination of the species; a table showing their geographical distribution, and a list of localities; also a list of the species wrongly placed in *Elænia* by different authors, with their proper designations; and finally a list of the specimens of *Elænia* (about 380) contained in the author's collection, and representing 39 of the 49 forms recognized.—J. A. A.

Berlepsch and Stolzmann on Birds from Peru.¹—During the years 1893-1898 M. Jean Kalnowski made considerable collections of birds in various parts of Peru, which form the basis of the present report. The species are listed in seven categories, in accordance with the localities at which they were collected, and include about 200 species. One genus and 14 subspecies are described as new, and several others are for the first time recorded from Peru. The technical annotations relate mainly to the character of the specimens in comparison with those from other localities but in part to questions of nomenclature. In adopting the name *hedwigæ* in place of *fulgentissima* for a species of *Chlorochrysa* (p. 108), these authors appear to have overlooked the fact that *fulgentissima* is the earlier name, the paper in which it occurs having been published Sept. 12, 1901, while *hedwigæ* was first published in the October number of 'The Ibis' of the same year, or nearly three weeks later than *fulgentissima*. Thirteen species of North American birds are recorded as winter visitors, of which eight are Plovers and Sandpipers and five are Passeres, the latter being *Hylocichla swainsoni*, *Piranga rubra*, *Dendroica "rara"* (= *cerulea*), *Wilsonia canadensis*, and *Empidonax pusillus traillii*.—J. A. A.

Jourdain's 'The Eggs of European Birds.'—Part II of this excellent work² treats the species in sequence, with their various subspecies, from No. 30, *Loxia leucoptera bifasciata*, to No. 78, *Motacilla flava*. Under each species are given the common vernacular names by which they are known in the various countries of Europe, references to the leading standard works on European birds, and to the works where the eggs of the species have been previously figured. The breeding range is next stated in general terms, and amplified in paragraphs relating to its general distribution (*a*) in the British Isles, (*b*) in continental Europe. The character and position of the nests are described in considerable detail, as are also the eggs and their principal variations. The measurements and weights given are often the averages of large series. About two pages are thus devoted to each species,

¹ Rapport sur les nouvelles Collections ornithologiques faites au Pérou par M. Jean Kalinowski. Par Hans Graf von Berlepsch et Jean Stolzmann. Ornith., Vol. XIII, Sept., 1906, pp. 63-133.

² The Eggs of European Birds. By the Rev. Francis C. R. Jourdain, M. A., M. B. O.U. Part II, London: R. H. Porter, 7 Princes St., Cavendish Square, W., 1906. Svo, pp. 81-160, 14 col. pll. Price, 10s. 6d. per part, net.

and less to the subspecies, filled with pertinent and well-digested information. The nomenclature and general view-point is well up to date. Marginal headings clearly set off the topical divisions of the subject matter, adding clearness of arrangement without sacrifice of space. The work gives the impression of thoroughness and reliability,—in others words, appears to be an excellent hand-book of European Oölogy, the plates being good, and the typography all that need be desired. The work will comprise ten parts, with 140 colored plates.—J. A. A.

Hartert's 'Die Vögel der Paläarktischen Fauna,' Heft IV.¹—Part IV of this exceedingly useful work completes the Paridæ, includes the families Laniidæ, Ampelidæ, Brachypodidæ, and Campephagidæ, and begins the family "Muscicapidæ," which here includes the current families Sylviidæ, 'Timeliidæ,' and Turdidæ, the author stating that it is impossible to separate the families Muscicapidæ, Sylviidæ and Turdidæ. The Muscicapidæ (sens. strict.) are all included in the present part, and the account of *Phylloscopus* (Sylviidæ auct.) is begun. About half-a-dozen subspecies are characterized as new.

The method of treatment is, of course, the same as in the former parts, and has already been stated in notices of them in this journal.² The present part includes species and subspecies Nos. 630–795. The general criticisms made in our notices of previous parts are still applicable here, and need not be repeated. Attention, however, may be called to a few points which go to confirm them, as where (p. 394) it is said that "*Regulus satrapa* muss als Unterart von *Regulus regulus* betrachtet werden"; and where (p. 423) *Lanius borealis* is not only made a subspecies of *L. excubitor* but all the various forms of *L. ludovicianus*, it is also declared, must be regarded as subspecies of *L. excubitor*. In the key on p. 456, *Ampelis cedrorum* is given as a subspecies of *A. garrulus*! Such combinations give the author's point of view in regard to the matter of subspecies, and may well be borne in mind when other parts of the work are under consideration.

He adopts *Bombycilla Vieillot*, 1807, for the Waxwings in place of *Ampelis* Linné, 1766, remarking that through no process of elimination can *Ampelis* be retained for the Waxwings. The reasons for a ruling so contrary to current usage would be welcome, none being here stated.—J. A. A.

Beebe on the 'Owls of the Nearctic Region.'—The Eleventh Annual Report of the New York Zoölogical Society contains two ornithological papers, both by the Curator of Birds, Mr. C. William Beebe. The first

¹ Die Vögel | der paläarktischen Fauna. | Systematische Übersicht | der | in Europa, Nord-Asien und der Mittelmeerregion | vorkommenden Vögel. | Von | Dr. Ernst Hartet. | — | Heft IV. | — | Seite 385–512. | Mit 32 Abbildungen. | — | Berlin. | Verlag von R. Friedländer und Sohn. | Ausgegeben im März 1907.—8vo, pp. 385–512. | Preise 4 mark.

² Auk, XXI, pp. 95, 505, XXII, p. 428.

relates to the 'Owls of the Nearctic Region' (pp. 157-192, with numerous half-tone illustrations), and the second is a 'List of the Birds living in the New York Zoological Park, December 31, 1906' (pp. 193-212).¹ (See below, under 'Notes and News.') Mr. Beebe treats first of owls in general, their structure, relationships and adaptations; then especially of the owls of North America, by groups or genera, enumerating the species, their ranges, and their leading characteristics and ways of life. We here meet for the first time, we believe, the adoption of the generic name *Otus* for the Screech Owls, in place of *Megascops*, in accordance with a recent and as yet unpublished ruling of the A. O. U. Committee on Nomenclature.¹ J. A. A.

Woodruff's 'The Birds of the Chicago Area.'²—The territory here considered includes all of Cook and Du Page Counties and the northern part of Will County, Illinois, and the northern part of Lake County, Indiana, or "an area about 50 miles square." An introduction of 24 pages describes the topographic and climatic conditions of the region, certain localities of special interest, with comment on certain extralimital species, and on migration. Then follows the list, very fully annotated, including the citation of authorities for the rarer records; the manner of occurrence is stated, often with reference to former conditions when the species was more abundant. In this connection Mr. E. W. Nelson's 'Birds of North-eastern Illinois,' published in 1876, is drawn upon at length, with great advantage. A short paragraph is usually devoted to the general range of the species outside of Illinois, based mainly on the ranges given in the A. O. U. Check-List or Mr. Ridgway's 'Birds of North and Middle America.' The classification and nomenclature of the A. O. U. Check-List being avowedly followed, considerable space under each species is rather wastefully devoted to synonymy.

The list has evidently been prepared with great care and can hence be safely taken as authoritative. It contains a large amount of conveniently arranged information about the birds of the 'Chicago Area,' both past and present. The number of species listed is apparently not stated. An extended — probably nearly complete — bibliography, and separate indexes to the scientific and common names, fittingly close this very creditable piece of work. Nine of the twelve half-tone plates illustrate special features of the country; the other three give views from life of a Bonaparte's Gull, a young Black Tern, and the Belted Plover, with its nest and eggs.—J. A. A.

¹ See, however, Stone, Auk, XX, 1903, pp. 272-276.

² The Birds of the Chicago Area. By Frank Morley Woodruff. Chicago Academy of Natural Sciences. Bulletin No. VI of the Natural History Survey. Issued April 15, 1907.—8vo, pp. 1-221, with 12 half-tone plates. Price, 75 cents.

Fleming on Migrations of Brünnich's Murre.¹—Brünnich's Murre is an Arctic species, breeding in North America from the Magdalen Islands, in the Gulf of St. Lawrence, northward, and appears to be ordinarily only to a small extent migratory. At intervals, however, it appears in some numbers as far south as Long Island, New York, and occurs as a straggler south to Chesapeake Bay and westward along the Great Lakes. Its appearance at any of these points is usually rare and irregular, but during the last fifteen years there have been several notable invasions of this species. Mr. Fleming has done excellent service in compiling and mapping these migrations. His record begins with the winter of 1890-91, when the species appeared in unusual numbers on the New England coast. None were noted for the winter of 1891-92, and only a few for that of 1892-93. In the winter of 1893-94 there was a large migration to the Great Lakes, notable as being their first appearance in this region, while few were seen on the Atlantic coast. The next great migration, and "the most extensive recorded," occurred in the winter of 1896-97, "reaching far down the Atlantic coast and into the interior of eastern North America"—on the coast to North and South Carolina, in the interior to central Indiana. The following winter there was a restricted migration to the St. Lawrence and its tributaries. In 1899-1900 there was again a widespread migration, extending southward along the coast to Virginia, and in the interior to Lake Ontario. For the following winter the records were few; more were seen in 1901-02, but during the following three winters there was no notable invasion.

Mr. Fleming gives reasons for believing that these migrations originate in Hudson Bay, and are caused by lack of food, due to the closing in of the moving and shore ice, thus depriving them of access to open water. They usually arrive in an emaciated condition, and, visiting regions "unsuited to sustain the life of a bird whose food is marine," it seems probable that none of the thousands of birds that make the unusual journey ever return to their place of origin. Two maps illustrate Mr. Fleming's excellent paper, one showing the places of record for the species from 1890 to 1903, and the other for the great migration of 1896.—J. A. A.

Lass's Bird Life of a City Garden.²—This is a list of birds observed in a city garden in Charleston, S. C., based on records made in 1902-06, inclusive, and numbers 90 species. Some are common summer residents and breeders in the garden; others are transient visitors or are noted as merely passing over, as in the case of some of the larger hawks, herons, etc. The list is naturally of much local interest, and was published largely for the

¹ The Unusual Migration of Brünnich's Murre (*Uria lomvia*) in Eastern North America. By J. H. Fleming. Proc. IVth Internat. Orn. Congress, 1905 (1906), pp. 528-543, with two maps.

² Bird Life of a City Garden. By Herbert Ravenal Lass. Bull. of College of Charleston Museum, Vol. II, No. 7, November, 1906, pp. 57-66.

purpose of awakening interest in nature study among the teachers of the city.

The same number of the 'Bulletin' records the capture of a Frigate Bird (*Fregata aquila*) on Sullivan Island, Charleston harbor, on October 20, 1906, which makes the second record of this species for South Carolina.—J. A. A.

Shufeldt on the Osteology of the Tubinares.¹—Following a review of the literature of the general subject, are a few pages on the osteology of *Puffinus borealis*, with a half-tone figure of the skeleton, and a short discussion of the taxonomy and affinities of the Tubinares. The classification that seems to the author to be "natural" is the same as that given in Sharpe's 'Hand-List of Birds.'—J. A. A.

NOTES AND NEWS.

ALFRED NEWTON, an Honorary Fellow of the American Ornithologists' Union, died at Cambridge, England, June 8, 1907, at the age of 78 years. Prof. Newton was born in Switzerland, June 11, 1829, of English parents, he being the fifth son of William Newton, formerly member of Parliament for Ipswich, and of Elizabeth (Milnes), daughter of Richard Slater Milnes, formerly member of Parliament for York. He was graduated B. A., in 1853, at Magdalen College, Cambridge, and later, as a traveling Fellow of the College (1854–1863), visited Lapland, Iceland, the West Indies, and North America, and in 1864 he visited Spitzbergen. He was elected professor of Zoölogy and Comparative Anatomy at Magdalen College in 1864, which position he held at the time of his death.

Professor Newton was one of the twenty original members of the British Ornithologists' Union, founded in November, 1858 at Magdalen College, Cambridge, which organization resulted in the establishment of a Quarterly Magazine of Ornithology, 'The Ibis,' the first volume of which was published in 1859, under the editorship of Dr. P. L. Selater. The second series of 'The Ibis' (1865–1870) was edited by Newton; he also prepared the bibliographical matter for the 'Aves' of the 'Zoölogical Record' for the years 1864–1869, and was editor of the 'Zoölogical Record,' 1870–1872. His principal publications are 'The Zoölogy of Ancient Europe' (1862), the 'Ornithology of Iceland' (1863), 'Oötheca Wolleyana' (1864–1907), 'Zoölogy' (1874, 1894), 'Yarrell's British Birds' (4th ed.,

¹ On the Osteology of the Tubinares. By R. W. Shufeldt. Amer. Nat., Vol. XLI, Feb. 1907, pp. 109–124.

Vols. I; II, 1871-1882), and 'A Dictionary of Birds' (1893-1896). The latter is made up largely of earlier contributions to the 'Encyclopædia Britannica,' here revised, often amplified, and brought down to date, with the assistance of several collaborators, as Dr. Gadow for the anatomical subjects and Dr. Lydekker for palæornithology. His minor contributions to the proceedings of various scientific societies and natural history journals are numerous and cover a wide range of ornithological subjects. His 'Dictionary of Birds,' however, is his enduring monument, and is the one ornithological work of greatest service to the greatest number. Newton's preëminent erudition in the field of ornithology, his excellent judgment in all matters bearing upon its history and development, and his unsurpassed clearness of exposition, are especially exemplified in the 'Dictionary,' the introduction to which is a critical review of the literature of ornithology of value for all time.

Professor Newton received medals from the Linnæan and Royal Societies of London, and served repeatedly as Vice-President of the Royal Society and of the Zoölogical Society, and was President of the Cambridge Philosophical Society. He took a deep interest in bird protection, first bringing the subject to the attention of the British Association for the Advancement of Science in 1868, and later securing the enactment of various Acts of Parliament for their protection. He was also chairman for many years of the British Association Committee on the Migration of Birds.

Doubtless few American ornithologists who have been in England have failed to visit Cambridge to make the acquaintance of this great master, who has won their respect, not to say affection, to a greater extent than any other foreign ornithologist. He was also a most genial and faithful correspondent. In a letter of his to the writer, dated 18 May, 1907, and thus written but three weeks before his death, he refers to himself as having been "more or less of an invalid" for the previous two months, but there is nothing to imply serious illness, or to arouse apprehension for the future. The news of his death by a cable dispatch from London thus came as a sad surprise.

THOMAS HENRY DOUGLASS, one of Illinois' best informed ornithologists, died at Los Angeles, Cal., April 2, 1907. Mr. and Mrs. Douglass left their home in Waukegan, Ill., in December to visit California, as they had done in several previous years. Mr. Douglass had a severe cold, and later heart trouble developed, which soon terminated fatally. He was 55 years old, and during the sixties and seventies did a good deal of active field work among the birds of Lake County, Illinois, securing many rare specimens of birds and eggs, which were then new to the State. Mr. Douglass conducted one of the largest nurseries in this country, his specialty being Conifers of every variety, which he raised from seeds and supplied the young trees to most of the other nurseries in the United States. He was a

thorough lover of nature, very modest and kind-hearted, and beloved by all who knew him.¹—H. K. C.

THE A. O. U. Committee on the Nomenclature and Classification of North American Birds held a five days' session in Washington in April (April 18–25), at which satisfactory progress was made in settling the large number of cases that awaited its action preparatory to the publication of a new edition of the Check-List. A few questions, relating mainly to little known forms of birds, were necessarily deferred on account of lack of material, but all questions of nomenclature were practically cleared away, and only the preparation of the manuscript for the printer remains to be completed. This, however, is a serious undertaking, especially the part relating to the geographical ranges of the species and subspecies. The preliminary draft for this part, kindly undertaken for the Committee by Mr. Stone, is, however, well advanced, but the new Check-List as a whole will probably not be ready for the printer before the end of the present year.

It is an open secret that the new Check-List will differ materially in arrangement from former editions, through the adoption of a modern system of classification, and also otherwise through the elimination of the old concordance and the secondary references. The various propositions in reference to the character of the vernacular names, which have been suggested to the Committee, either publically in 'The Condor' or 'The Auk,' and also privately through correspondence, have been carefully and for the most part favorably considered, so that the changes that will be made in this respect will meet all of the essential objections that have been raised in reference to this important feature of the Check-List.

THE rapid development of the New York Zoölogical Park is emphasized by the Eleventh Annual Report of the Society (for the year 1906) recently issued. The satisfactory increase of all the departments, and the completion of many permanent improvements is noted, as also the good health and very low rate of mortality prevailing among the animals. The bird collection, at the close of the year 1906, "contained living examples of 26 orders of birds out of the total 31 orders," while the net increase over 1905 was 136 species and 549 specimens. The total number of specimens at the end of 1906 was 2104, representing 491 species, the birds of the United States being represented by about 170 species. Great advance has been made in labeling the collection with large descriptive labels, embracing maps showing the distribution of the species. The management, Director Hornaday, and his able corps of Curators, are entitled to the highest credit for developing a zoölogical park of the first rank in so short a period.

[¹ See also an appreciative reference to Mr. Douglass in 'The Auk' for April, 1907, p. 122, in a paper by Mr. John F. Ferry on 'Ornithological Conditions in North-eastern Illinois,'—Ed.]

DURING the last year a considerable number of important bird groups have been added to the collections of the American Museum of Natural History, a more detailed account of which, with illustrations, may be given later. These include, among others, the Heath Hen, the Prairie Hen, the Sage Grouse, the Golden Eagle, the Sand Hill Crane, the Anhinga, the Farallone Cormorant, an Arizona Desert Group, and a new Brown Pelican Group. Material was gathered in April and May of the present year by Mr. Chapman in the Bahamas for a Man-o'-War Bird group and a Booby group, and in Georgia for an Egret group. He is now in the Saskatchewan region to secure material for a large group of marsh-breeding waterfowl, and later will visit the Canadian Rockies for material for groups of Alpine species.

MR. E. THOMPSON SETON, accompanied by Mr. Edward A. Preble of the U. S. Biological Survey, is spending the present season in the exploration of the region northeast of Lake Athabasca, with especial reference to the mammals and birds, and will doubtless add greatly to our knowledge of that little known area.

THE occurrence of an immense flock of Thick-billed Parrots (*Rhynchopsitta pachyrhyncha*), numbering from 700 to 1,000, in the Chiricahua Mountains, Arizona, in August, 1904, is recorded in 'The Condor' for July, 1907 (IX, p. 104) by Mr. Austin P. Smith, who believes that this species is not so casual in Arizona as has been supposed, but may be expected to occur "every few years or so" in the mountains of southern Arizona.

A NOTEWORTHY arrival at the Zoölogical Gardens in London is a collection of living South American Hummingbirds received May 27 last, through the liberality of Captain Albert Pam. Of a consignment of some fifty specimens, all from Venezuela, twenty arrived alive, representing four species.

Shufeldt, R. W. (1) Polygamy and other modes of mating among Birds. (Amer. Nat., XLI, March, 1907.) (2) Ueber das Sammeln von Eiern und Muscheln. (Natur und Hans, XV, 1907, pp. 161-163, 183-186.)

Thayer, John E., and Outram Bangs. A new race of the Californian Thrasher from Lower California. (Proc. N. Engl. Zool. Club, IV, pp. 17, 18, April 30, 1907.)

Van Oort, E. D. (1) On the occurrence of *Platalea regia* on Celebes, Boeroe and Timor. (Notes from the Leyden Museum, XXIX, 1907, pp. 68-70.) (2) On a new subspecies of the genus *Pitohui* Lesson, with an enumeration of the species of this genus in the Collection of the Leyden Museum. (*Ibid.*, pp. 71-76.) (3) On *Edoliisoma morio* (S. Müller). (*Ibid.*, pp. 77, 78.)

Ward, Henry L. King Eiders at Milwaukee — a correction. (Bull. Wisconsin Nat. Hist. Soc., V, No. 2, 1907, pp. 136, 137.)

Williams, R. W., Jr. Game Protection in Florida. (U. S. Depart. Agric., Bur. Biol. Surv., Circular No. 59, May 3, 1907.)

Woodruff, Frank Morley. The Birds of the Chicago Area. (Chicago Academy of Natural Science, the Natural History Survey, Bull. No. VI, April 15, 1907.)

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(Continued on 3rd page of Cover.)

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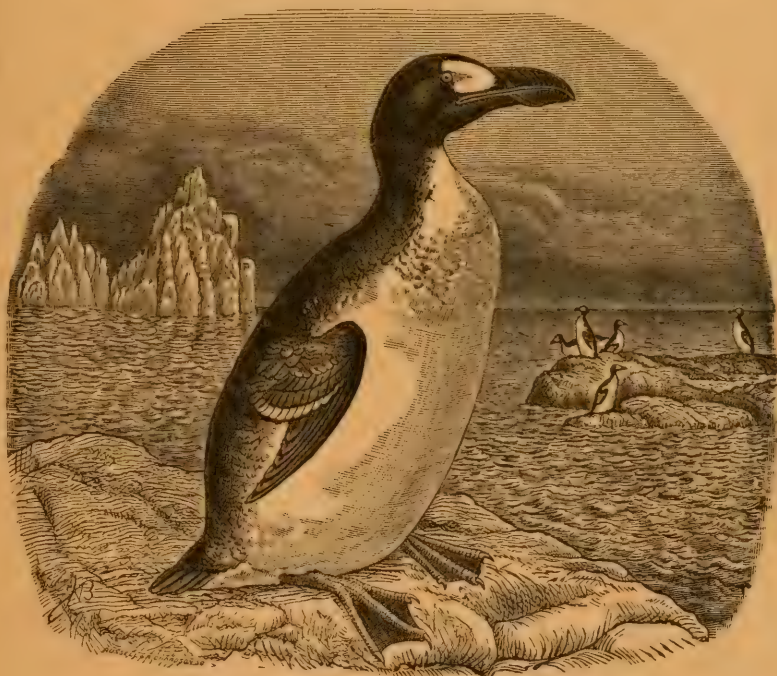
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CONTENTS.

	PAGE
A LAPLAND LONGSPUR TRAGEDY. By <i>Thomas S. Roberts, M. D.</i> (Plates XIII and XIV.)	369
OBSERVATIONS ON SOME BIRDS PROCURED NEAR CHARLESTON, S. C. By <i>Arthur T. Wayne</i>	377
ON HYBRIDS BETWEEN THE MALLARD (<i>Anas boschas</i>) AND CERTAIN OTHER DUCKS. By <i>Henry B. Bigelow</i>	382
THE BIRDS OF CUSTER AND DAWSON COUNTIES, MONTANA. By <i>E. S. Cameron.</i> (Plates XV and XVI)	389
SUMMER BIRDS OF SOUTHWESTERN SASKATCHEWAN. By <i>A. C. Bent.</i> (Plates XVII-XX.)	407
FURTHER NOTES FROM EXTREME SOUTHERN ILLINOIS. By <i>John P. Ferry</i>	430
GENERAL NOTES.—The Kittiwake and Purple Sandpiper again in Maine in Summer, 435; That Cinnamon Teal Record from Florida, 435; The Snowy Heron in Camden County, N. J., 436; American Coot (<i>Fulica americana</i>) Nesting near Newark, N. J., 436; The Stilt Sandpiper in Massachusetts, 437; The Buff-breasted Sandpiper (<i>Tryngites subruficollis</i>) on Long Island, N. Y., 437; American Goshawk (<i>Accipiter atricapillus</i>) versus Man and Barred Owl, 437; Unusual Occurrence of the Short-eared Owl in Pennsylvania, 438; The Breeding of the Short-eared Owl (<i>Asio accipitrinus</i>) near Ann Arbor, Michigan, 439; Mortality among Kingfishers, 439; The American Crossbill in Camden County, Ga., 439; Nesting of Crossbills in Colorado, 440; Occurrence of a White-winged Crossbill at Oxen Hill, Md., in August, 442; The Vesper Sparrow (<i>Poocetes gramineus</i>) on Long Island, N. Y., 442; A White-throated Sparrow in Washington, D. C., in August, 442; Nesting of the Rose-breasted Grosbeak in Philadelphia County, Pa., 442; An Intergrade between <i>Helminthophila pinus</i> and <i>H. leucobronchialis</i> captured in Hyde Park, Mass., 443; Additional Notes on the Brewster's Warbler in the Arnold Arboretum, Jamaica Plain, Mass., 444; <i>Helminthophila leucobronchialis</i> (Brewst.) in Lexington, Mass., 444; A Correction, 446; The Northern Water-Thrush again Nesting in Massachusetts, 446; A Mockingbird (<i>Mimus polyglottos</i>) in Lexington, Mass., in Winter and Summer, 446; The Great Carolina Wren in Southern Rhode Island, 446; Large Set of Brown-headed Nuthatch's Eggs, 447; A Recent Blue-gray Gnatcatcher (<i>Poliophtila cerulea</i>) in Delaware Co., Pa., 447; Two Birds New for Ohio (<i>Oceanites oceanicus</i> and <i>Merula migratoria achrustera</i>), 447; Pettiver's 'Gazophylacium,' 448; Supplemental Note to 'A Lapland Longspur Tragedy,' 449.	
RECENT LITERATURE.—Ridgway's 'The Birds of North and Middle America,' Part IV, 450; Townsend and Allen's 'Birds of Labrador,' 451; Townsend's 'Along the Labrador Coast,' 452; Clark on New Birds from Eastern Asia and the Aleutian Islands, 453; Blackwelder's Notes on Chinese Zoology, 453; Bangs on Birds from Costa Rica and Chiriqui, 453; Clarke 'On the Birds of the Weddell and adjacent Seas, 454; Goeldi's 'Album de Aves Amazonicas,' 455; Mrs. Davenport's 'Birds of Windham and Bennington Counties, Vermont,' 456; Herman's 'The Protection of Birds in Hungary,' 456; Williams's 'Game Commissions and Wardens,' 457; Anderson's 'The Birds of Iowa,' 458; Rich's 'Feathered Game of the Northeast,' 459.	
CORRESPONDENCE.—Protective Coloration, 460.	
NOTES AND NEWS.—Obituary, Dr. William La Grange Ralph, 461. The Seventh International Zoological Congress, 462; Twenty-fifth Congress of the American Ornithologists' Union, 466.	
INDEX	467
ERRATA	492
CONTENTS OF VOLUME	iii
OFFICERS AND MEMBERS	ix

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A LAPLAND LONGSPUR TRAGEDY.

Dead Lapland Longspurs lying where they fell on the ice of a lake near Worthington, Minn., during a storm, March 13-14, 1904.

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A LAPLAND LONGSPUR TRAGEDY:

BEING AN ACCOUNT OF A GREAT DESTRUCTION OF THESE BIRDS DURING A STORM IN SOUTHWESTERN MINNESOTA AND NORTHWESTERN IOWA IN MARCH, 1904.¹

BY THOMAS S. ROBERTS, M. D.

Director, Department Birds, Minnesota Natural History Survey.

Plates XIII and XIV.

A CONSIDERABLE amount of interesting and highly valuable information in regard to the always mysterious migratory movements of birds has been obtained of late years by studying the destructive effects of great or unseasonable elemental disturbances; such disturbances operating either alone or, more frequently, in conjunction with various artificial obstructions of human devising. Lighthouses, prominent electric lights in cities and villages, brilliantly illuminated buildings and similar lures, together with the net-work of wires, that now form a huge cobweb over such a large portion of the surface of the globe, serve, especially in times of unusual darkness and storm, to lead to their death countless thousands of the hurrying, migrating hosts. The light of morning permits an inventory of the dead and dying that reveals, not infrequently, facts that are new in regard to the movement, distribution and comparative abundance of little known species and much in regard to many others that may be surprising and that could have been learned in scarcely any other way.

It is my purpose in this article to present to the Union an account of one of these great bird catastrophies that, by reason of its extent

¹ Read at the Twenty-third Congress of the A. O. U., New York, Nov. 16, 1905.

and some of the questions involved, may prove interesting even if it be possessed of no very great intrinsic value.

About the middle of March, 1904, there appeared in the daily papers of several Minnesota cities and villages brief telegraphic statements of the destruction of large numbers of a small brown bird during the night of March 13-14 in and about the villages of Worthington and Slayton in southwestern Minnesota, well out in the prairie portion of the State. A day or two later several of the dead birds were sent by a physician of Slayton to the State University at Minneapolis, and were referred to the writer for identification. They proved to be Lapland Longspurs (*Calcarius lapponicus*). Nearly a week had now elapsed, but as it was learned by telephoning to one of the towns in question that the accounts were not unfounded or exaggerated and that abundant evidence of the bird destruction still remained, Dr. L. O. Dart was sent as a representative of the State Natural History Survey to gather all possible data bearing upon the event, and it is from the information secured by him that this account is prepared.

Dr. Dart went first to Worthington and Slayton, the two places where the birds were killed in greatest numbers, and there made careful personal examination into the then existing conditions by studying the numbers and distribution of the dead birds and the post mortem findings; and also had a series of interviews with various residents who had been eye-witnesses of the event. A less thorough examination was made at several other places. A few days later letters of inquiry were addressed to the postmasters at some twenty-three villages in southwestern Minnesota, northwestern Iowa and southeastern South Dakota in an attempt to secure further information that might give some definite idea of the extent of the area of destruction. Ten replies were received to these letters. Most of the citizens in the towns where the birds were killed had been so impressed by the extent and unusual character of the phenomenon that they were ready and indeed eager to give their experiences and to get any expression of opinion as to the causes of what was locally called "the great bird shower."

Beginning his observations at Worthington, the county seat of Noble County, on March 22, eight days after the Longspurs were destroyed, Dr. Dart found large numbers of dead birds in all the

streets of the village, but it was said that many had been washed away by a hard rain storm which occurred on the night of the 20th. All over the courthouse yard dead birds lay only five or six feet apart, and this was reported to have been the condition throughout the town the morning after the storm. Adjoining the town on the west and the east lie two small lakes, each having an area, at a very conservative estimate, of one square mile. The winter ice was still on these lakes but the snow had melted and frozen again, thus presenting an unobstructed hard surface. Here the dead birds were more conspicuous than among the grass and mud of the fields and town, and the ice was found to be everywhere dotted with their bodies over the entire surface of both lakes. Dr. Dart walked out to the middle of each lake and made careful estimates by measuring off a number of twenty-foot-square areas in various places and counting the birds in each. The average showed five and a half birds to the four hundred square feet, or a total of 374,328 birds on each lake, which reveals the remarkable fact that in round figures there were 750,000 Lapland Longspurs on the surface of these two lakes alone! And this figure, large as it may seem, is really less than the truth, for the estimate, in order to keep well within bounds, has been cut in one or two places, and a million birds, incredible though it may seem, is probably nearer the truth.

In clumps of bushes around one of these lakes were many live Longspurs, showing evidences of various injuries more or less severe. Some could not fly sufficiently to avoid being taken in the hand. They had evidently managed since the storm to eke out an existence in these sheltered places, unnatural haunts though they were for Lapland Longspurs. At a residence in town were seen two live Longspurs, a male and female, among the plants in a window garden where they had been fed and lived contentedly since their capture on the 14th. They were not at all shy. Dr. Dart states in his notes that from his observations about town he could not determine positively that there were, or had been, more dead birds under the wires than elsewhere.

The interviews had at Worthington resulted as follows: The village night-watchman said that on the night of the 13th-14th there was practically no wind and that snow was falling steadily and quietly during a portion of the night. He first noticed the

birds about 11 P. M. and from that hour they were abundant until morning. They were most numerous in the vicinity of the electric street lamps but he remarked, "they seemed to be everywhere." He saw many fly against buildings and picked them up dead and heard others strike and fall in the darkness. He said the ground in places was covered with dead, wounded and apparently unhurt birds. A great many were buried in the snow with just their heads out and some of them when picked up, warmed, and dried, would fly away as well as ever so far as he could see. These birds appeared to him more bewildered than hurt.

The night telegraph operator stated that he counted sixty-one dead birds in going one and one-half blocks and saw fully one hundred live ones. He caught seven or eight of the latter, carried them home, warmed and dried them and when released next day, they flew off all right, except one bird which was injured. The night was not cold. The snow was in large flakes, quite wet, and fell quietly to the depth of five or six inches. The birds began to arrive about 11 P. M. and continued until three or four in the morning.

Another observer who was out at midnight said that the air was everywhere full of birds but that they were more numerous about the electric lights than elsewhere. He saw some inside of the arc-light globes. Many were captured and examined. Some were injured but others were not. These latter would lie in the snow and make no effort to escape. The feathers of many were soaked from the wet snow. The walks and streets were covered with dead and live birds.

An electrician in the employ of the electric light company reported that on the night in question there was a scarcely perceptible wind from a little east of south. The temperature was above freezing. The birds appeared about 11 P. M. and kept coming until nearly daylight. He corroborated what the others had said but thought that the next morning the dead birds were most numerous under the electric lights and net work of wires in the central portion of the village. The ground in such places was literally covered with them. He took five or six out of one electric light globe. He caught ten or twelve and took them home. They were not timid and ate ravenously out of the hand. All flew away when liberated later.



Dead Lapland Longspurs lying where they fell among the grass in the Court House Square, Worthington, Minn., during a storm, March 13-14, 1904.



Lapland Longspurs killed during a storm at Worthington, Minn.,
March 13-14, 1904.

A Mr. Drobeck reported that on the morning following the storm he noticed lumps or balls of snow on the roof of his barn and that when they thawed in the morning sun, they were found to contain live birds. The heads of the birds would first appear, and then, shaking off the snow, they would sit for a time in the sun drying and preening themselves and then fly off. He caught several and took them in the house and it was two of these birds that Dr. Dart saw in his window garden a week later. This curious statement was corroborated by a second observer. Evidently the birds had become wet and snow-laden, and falling into the sticky snow had by their efforts rolled themselves into snow-balls.

Dr. Manson and Dr. Humiston, two physicians of Worthington, gave their testimony along the same lines as above. The former added that he noticed that many of the birds had entered the snow head foremost as though they had pitched down head-long rather than as though they had fluttered down as they probably would have done after striking some obstacle. When these birds were picked out of the snow it was found that the snow was stained with blood that had oozed from their mouths.

Slayton, the county seat of Murray County, situated about twenty-five miles north and six miles west of Worthington, was the next place investigated. It was stated by several residents of this village that on March 13, after a rainy and windy afternoon, the wind fell toward night to a gentle breeze from the southeast, and later a heavy wet snow began falling which continued for several hours, but the snow accumulated to a depth of only an inch or two. The temperature was above freezing. There were no electric lights here, the streets being lighted with gas. There were also fewer wires. On the 23d of March, nine days after the storm, Dr. Dart states that dead birds were in evidence everywhere in town. Heads, wings and tails could be seen sticking out of the mud everywhere in the main street and in other streets even to the outskirts of the town. It was stated that on the morning of the 14th twenty-nine dead birds were swept off the seventy-five feet of sidewalk in front of the hotel. From the roof of the latter building Dr. Dart counted nineteen dead Longspurs in the eaves-trough, and undoubtedly many had been washed away by the heavy rain on the 20th. Scattered over the roof of an adjoining building

were a number of dead birds, and others lay in the eaves-trough of still another building.

It was stated that nearly every family in the town had captured from two or three to a dozen or more live birds and that after they had been cared for for a short time they flew off as well as ever. Thirty-six hours after the storm twenty-one live birds were counted harboring in one of the lumber yards. A German farmer living a half mile northwest of the town saw six birds at his place on the morning of the 14th; four were dead and two alive. The latter he caught, took them in the house and later they flew away.

In view of his experience at Worthington, Dr. Dart made an examination of the ice on a small lake a half mile or so from Slayton, but found no dead birds there.

Dr. Davis of Slayton reported that the day following the storm he drove forty miles east of the town and did not see any dead birds outside of the village. He, however, saw flock after flock of Longspurs, and thinks that he never before saw so many of these birds at this time of the year. On the morning of the 14th he picked up fifty dead birds in a space twenty-five by fifty feet behind a store. He thought the greatest destruction was in the central part of the town.

Dr. Lowe, however, said that dead and live birds were all over town and that his children picked up sixty-one in his door yard and that many still remained. He counted twenty-one on the ground under one lamp-post. Dr. Lowe and the editor of the local paper reported that there were many birds perched on the window sills all over town early in the morning after the storm.

The Slayton town marshal said that on the afternoon of the 13th he saw large flocks of small birds on a hill north of town. He first noticed the birds at night a little after nine o'clock. The birds seemed to come from the east and were circling over the town and twittering as though confused and lost. Between nine and ten, he saw many strike windows and fall dead or stunned. After 10 P. M. there were only three street lights burning and around these lamps the dead birds were most numerous. On the following morning most of the dead birds were under the snow. Three or four days after the occurrence many of the birds were still flying about the town.

At Avoca, a little town seven miles southeast of Slayton, Dr. Dart saw dead Longspurs in the streets and on the ice of a small lake near by.

W. J. Ross, station agent at Heron Lake, twenty-five miles southeast of Slayton, reported that many birds were killed there in the same storm — all Longspurs.

Information gleaned by personal interview with a man who had been an eye-witness showed that large numbers of Longspurs had been killed on the night in question at Luverne, the county seat of Rock County, and distant thirty miles due west from Worthington. Also that dead birds were to be seen at all points along the railroad between the two places.

A communication from the postmaster at Sibley, the county seat of Osceola County in northern Iowa, fifteen miles southwest of Worthington, stated that many birds were killed there on the night of the 13th–14th during a snow storm. On the morning of the 14th he saw from seventy-five to one hundred dead birds as he walked three blocks to the post-office. There were also many live birds unable to fly, some of which stayed about several days. There are no electric lights in Sibley.

C. A. Kinsey reported by letter from Adrian, a town eighteen miles west of Worthington, that the birds appeared there in the early half of the night, and while he did not think that they were killed in large numbers, many were on the ground through the night and the following morning, unable to fly.

Reports received from a number of other localities, including letters from John Crawford of Lakefield, John Knox of Jackson, and A. D. Brown of Pipestone, showed, by the negative evidence they furnished, the outside limits of the Longspur flight. In this way it is possible to define fairly well the region within which the destruction took place and it would appear that this area embraced at least fifteen hundred (1500) square miles. There are about forty towns and villages within this region, but many of them are small and probably did not figure largely as centers of bird destruction.

A brief statement may be offered in regard to the post mortem findings of the dead birds. The bodies of many birds were carefully examined at all points where observations were made and the

findings were uniform. Briefly, all died from injuries of various kinds. Besides some one hundred and fifty birds examined carefully in the field, one hundred were picked up on the ice at Worthington and about the village and as a matter of curiosity were brought home, dissected and detailed autopsy notes made of each. A general summary of these notes show that in many the skulls had been fractured and indented, leading to cerebral hemorrhages; while in many more the bones of the body had been variously crushed, accompanied by extensive internal hemorrhages. In some instances the impact had been forcible enough to rupture the intestines, lungs or other viscera. A few had their necks broken. Many had broken wings and legs associated with other more fatal injuries. The birds picked up on the ice had just as extensive injuries as those found elsewhere, and it seemed certain that in their utter confusion they must have dashed headlong onto the surface of the lake from a considerable height. All the birds were very fat and had been in excellent condition. Examination of the stomachs of many dead birds revealed the fact that all were empty except for small amounts of fine gravel; even this was wanting in some instances.

It would be futile to attempt any calculation as to the probable number of birds killed during that one night. The center of destruction seems to have been at Worthington, where, taking the reasonably accurate basis of calculation furnished by the lake surfaces as a guide, it would seem that certainly not far short of a million and a half birds were killed. Not as many were killed at other points, so far as known, but what the grand total for the whole area of fifteen hundred (1500) square miles must have been I will leave for your imagination to picture. All of the birds were Lapland Longspurs. Not an individual of any other species was found.

As to the explanation of this catastrophe: It is plain enough that on the fateful night there was in progress an immense migratory movement of Lapland Longspurs leaving the prairies of Iowa where they had passed the winter months for their summer homes in the Northland, and that becoming confused in the storm-area by the darkness and heavy falling snow they were attracted by the lights of the towns and congregated in great numbers over and about these places. In their bewildered condition great numbers flew

against various obstacles and were killed or stunned while many others sank to the ground exhausted. It would also seem probable that a considerable number became wet and snow-laden by reason of the character of the snow, and thus, unable to fly, were forced downward to the earth to be dashed to death if falling from a considerable height, or simply stunned if from a lower elevation. This theory that the birds fell heavily or darted swiftly downward from high in the air would seem to be the only way to explain the presence and the extensively mutilated condition of the dead birds on the ice of the lakes at Worthington and elsewhere. Many of the dead birds found in the yards and fields and on the roofs of buildings appear to have met death in the same manner.

OBSERVATIONS ON SOME BIRDS PROCURED NEAR CHARLESTON, SOUTH CAROLINA.

BY ARTHUR T. WAYNE.

Colymbus auritus. HORNED GREBE.—This Grebe is exceedingly abundant from November until the middle of March, but it is rare to obtain one in full adult nuptial plumage while the birds sojourn here, as they commence to migrate long before the breeding plumage is acquired. The change from winter to summer plumage begins about the 10th of March. A specimen taken April 7, 1888, was assuming the characteristic nuptial plumage, while a bird shot on March 21, 1906, has the throat mottled with black and the fore neck pale chestnut.

Dr. Eugene Edmund Murphy took a specimen in almost perfect nuptial plumage at Cape Romain on May 15, 1904, and the writer procured a male near Mount Pleasant, on June 5, 1907, which very closely resembles the bird taken by Dr. Murphy. Both of these birds were in good condition, and not wounded, hence it is remarkable that they should have remained on this coast so late in the season of reproduction.

Nyctanassa violacea. YELLOW-CROWNED NIGHT HERON.—On March 23, 1907, the writer shot a female of this handsome

species, and upon examination found the abdomen bare and the skin wrinkled showing that incubation was going on even at this early date. Upon dissecting the specimen it was found that two eggs had been laid, while the third, which would have been the last, was almost ready for extrusion. As far as my information on the breeding of this species goes this is the earliest record for the South Atlantic States, with the possible exception of the southern part of Florida. It must be borne in mind, however, that the winter of 1907 was exceptionally mild, and July and August temperatures prevailed during the latter half of March. The day on which this heron was shot the thermometer registered 94.2 degrees.

***Helminthophila bachmanii*.** BACHMAN'S WARBLER.—During the month of March, 1907, I kept a sharp lookout in suitable localities near my home for the arrival of this rare warbler, but although I was in the woods almost daily no birds were observed until the breeding ground was visited, when six pairs were located in various parts of the swamp where the first nests and eggs were taken in April, 1906 (see Auk, XXIV, Jan., 1907, pp. 43-48). Some of the birds must have certainly arrived not later than February 28 or March 2, as the first nest, found on March 27, contained one egg. This nest was left until the 30th, when it contained four fresh eggs and the female was incubating.

On April 3 I found a nest which contained *five* eggs far advanced in incubation. This nest and eggs was found within fifty feet of the spot where the first nest was taken on April 17, 1906, and doubtless belonged to the same pair. This nest was evidently commenced on March 9, and as it requires fourteen days for the completion, and five days in which to deposit five eggs, it will be seen that on March 27 or 28 incubation must have just begun, as the eggs were undoubtedly incubated for at least eight or nine days. These nesting dates are important, and prove that although this species does not winter it is one of the earliest migrants in the spring and breeds even earlier than the resident Yellow-throated (*Dendroica dominica*) and Pine Warblers (*Dendroica vigoensis*). It also proves that the birds which breed in South Carolina reach their summer home much earlier than those which migrate along the Gulf coast States and breed in the Mississippi Valley, for the Bachman's Warblers that breed in the low coast region of this State undoubtedly migrate along the Atlantic coast.

At Branford on the Suwannee River, Florida, the writer first met and secured this warbler on March 14, 1892, while migrating birds were noted until April 2. The next year I was collecting at Old Town, sixty miles down the Suwannee (from Branford), and took the first Bachman's Warbler on March 10, the birds being noted until the 22d of the month, when all had apparently gone north.

In 1894 I obtained the first specimen on March 13 at the headwaters of the Wacissa River, Jefferson County, Florida. Although I recorded this bird as a migrant (Auk, Vol. XII, October, 1895, p. 367) I now believe that it breeds locally and sparingly near the village of Waukeenah.

On March 30, 1907, I shot a fine male of this warbler near Mount Pleasant from near the top of a huge water-oak tree some eighty feet above the ground. It was singing exactly like a Prothonotary Warbler (*Protonotaria citrea*), and when I went to locate the singer I was surprised to see that it was not that warbler, but one with a black throat and breast patch. The bird sang constantly, and as the song was identical with that of the Prothonotary I concluded that it must have been either the Golden-winged (*Helminthophila chrysoptera*) or Lawrence's Warbler (*H. lawrencei*) — forms I have not seen in life — and determined to secure it, which I did, after having heard it sing for more than twenty minutes. Upon securing the specimen I was amazed to find that it was in reality a Bachman's Warbler. This song must be very rare or else produced by a bachelor male.

Helminthophila celata orester. ROCKY MOUNTAIN ORANGE-CROWNED WARBLER.—On December 6, 1893, I shot a very large and richly colored specimen (♂ ad.) of what I supposed was the Lutescent Warbler (*Helminthophila celata lutescens*). I sent this bird to my friend Mr. William Brewster for determination, and under date of January 25, 1894, he wrote concerning the specimen as follows: "The Orange-crowned Warbler is *not lutescens*. It is not nearly yellow enough but matches closely the birds which occur in Texas and the Mississippi Valley generally."

In 'The Auk,' XXII, July, 1905, pp. 243-245, Mr. Harry C. Oberholser described under the name *Vermivora celata orester* a new form of the Orange-crowned Warbler from the mountains

of New Mexico. Having the specimen in mind that I sent to Mr. Brewster in January, 1894, I wrote him in August, 1905, for the loan of it. He very kindly forwarded the specimen, together with a large series of specimens of the form *celata* from Colorado Springs, Colorado, that he personally collected. Upon comparing the South Carolina bird with Mr. Brewster's series from Colorado I found that the former was even more richly colored than any of the latter and was an ultra typical example of Mr. Oberholser's new race, *orestera*. This discovery led me to examine my South Carolina specimens of Orange-crowned Warblers, that I had packed away for many years, and the result was I found no less than three birds clearly referable to *orestera*, as follows: January 2, 1890, male; February 11, 1891, male; December 3, 1896, male, all of which were taken near Mount Pleasant.

The bird taken December 3, 1896, is an ultra typical example of *orestera* while the others are nearer that form than *celata*.

This new race is supposed to be a Rocky Mountain breeder, and Prof. W. W. Cooke¹ is of the opinion that no bird (which breeds in these mountains) migrates to the Atlantic Coast unless it breeds in the Mackenzie River region.

If this form is entitled to recognition another far western bird is added to the fauna of South Carolina.

Dendroica tigrina. CAPE MAY WARBLER.—This beautiful species is a regular although rare autumnal migrant along the coast, but I have not as yet detected it in the spring. Up to 1905 my latest autumnal record was October 18, and the earliest September 8. On October 31, 1906, I shot a young male in my yard, which was feeding among some lavender bushes, and on November 3 I secured a young female at the same spot where the male was obtained.

All the early migrating Cape Mays have been adult birds, whereas the latest migrants are invariably the young of the year, which is indeed very strange. At Chester, Mr. Leverett M. Loomis noted this warbler from October 4 to 26 (Auk, VIII, April, 1891, p. 170). It will be seen that the birds arrive near Charleston nearly a month earlier than at Chester.

Dendroica striata. BLACK-POLL WARBLER.—The Black-poll

¹ W. W. Cooke, in epist.

Warbler is abundant during both migrations, but more abundant in the autumn than in spring. On November 14, 1906, I procured a female in my yard. The day upon which the bird was shot the thermometer registered 28°. My latest previous record is October 29, 1894, and as far as I am aware the bird taken November 14, 1906, is the latest record for the United States with the exception of one from southern Florida taken or observed on November 16, 1887. (See Distribution and Migration of North American Warblers, Bull. Biol. Survey, No. 18, 1904, by Wells W. Cooke.)

Sitta canadensis. RED-BREASTED NUTHATCH.—In 'The Auk,' XIII, 1896, p. 85, the writer recorded two birds of this species from Long Island, taken November 14, 1895. Since these birds were observed I have found the species to be an irregular autumn and early winter visitor, as the following records will show: Long Island, November 27, 1901. Shot six and saw upwards of a hundred in pine and cedar woods; also shot two on December 26 at the same place. Dewees Island, December 18, 1903. Took an adult male. Oakland plantation, Christ Church Parish, October 29, 1906. Shot an adult male, the specimen being the only one I have as yet observed on the mainland. My friend Mr. Herbert Ravenel Sass observed two birds in his garden in Charleston on October 29, 1906. Long Island, November 3, 1906. Saw upwards of twenty-five and obtained two. Dewees Island, November 17, 1906. Shot two males and observed perhaps thirty individuals.

This species shows moult when it arrives, and as long as it remains, which is certainly remarkable. The birds feed upon the seeds of the pine and cedar and seem to be particularly fond of the seeds of the latter tree. While the birds have been common in November, 1901, and November, 1906, they apparently do not remain through the winter months, but disappear almost as suddenly as they arrive. Mr. James P. Garick, Jr., informs me that the birds were very abundant at his home in Weston (a few miles south of Columbia) in the autumn of 1906, and I have a very high plumaged male taken by him on October 10, 1906.

Polioptila cærulea. BLUE-GRAY GNATCATCHER.—Although this species is said to winter from "Florida southward" by Mr. Chapman (Birds of Eastern North America, 1895, p. 394) and also by Mr. Ridgway (Birds of North and Middle America, Part III,

1904, p. 718) who says: "wintering in Florida and other Gulf States," these statements are misleading and inaccurate, for the Blue-gray Gnatcatcher winters regularly on the coast of South Carolina. I have long known this fact, for on December 15, 1885, I saw about a dozen birds near Charleston and shot four specimens; while in January, 1886, others were noted during the memorable blizzard, and which was the coldest weather up to February, 1899. I herewith mention a few dates on which others were taken: January 10, 1889, one; January 2, 1893, one; December 26, 1898, saw two and obtained one; February 4, 1903, one. All the specimens taken are apparently *immature* birds and the question is where do the adults winter? As they are presumably more hardy than the young the assumption would be that they, or at least some of them, winter at points along the coast to the northward of Charleston. This is, however, not the case as there are no records of the birds wintering in North Carolina. Why the *young* of this species should winter and not the *adult* is certainly very strange.

ON HYBRIDS BETWEEN THE MALLARD (*ANAS BOSCHAS*) AND CERTAIN OTHER DUCKS.

BY HENRY B. BIGELOW.

THE collection of the Museum of Comparative Zoölogy at Harvard University contains four hybrid ducks which are well worthy of description. In all one parent is Mallard, the other being Black Duck, Pintail and Baldpate respectively. All of these crosses have been previously noted, the Black Duck cross repeatedly, but very few specimens have been described in detail; or with any special reference to the relations of colors to color patterns in parents and hybrid offspring. A complete summary of all descriptions of Hybrid birds published previous to 1906 will be found in Suchetet.¹

1. MALLARD (*Anas boschas*) × BLACK DUCK (*Anas obscura*).

¹ Des Hybrides à l'état sauvage....des Oiseaux, 1897.

Museum of Comparative Zoölogy, No. 42855, ♂, shot on Currituck Sound, N. C., Jan. 9, 1889, by Dr. John Bryant.

The head of this specimen presents a very interesting appearance. The crown, as far back as the occipital region, is dark chocolate brown, the feathers margined and tipped with pale fulvous as in the Black Duck. The sides of the head below the line of the eye are light yellowish brown, striped with dark fulvous and *green*; while the postocular region, comprising a band about .75 in. in breadth running around to the back of the neck, is bright 'Mallard green.' The throat, and lower side of the fore-neck are thickly spotted with fulvous and green, with a few pale spots: a condition seen, though to a lesser degree, in young male Mallards. At the junction of neck and breast the feathers are very pale: this being the only suggestion of the white collar of the Mallard.

The breast, for a band about 4 inches broad, is of the characteristic Mallard chestnut, each feather, however, marked with a semilunar patch of dark brown. Posteriorly the chestnut of the breast shades into a pale yellowish brown, considerably darker than the belly color of the Mallard. At the level of the legs the semilunar spots disappear. Although the general tint of the belly is very much darker than in the Mallard, yet near the sides the characteristic vermiculations of that species can faintly be traced, as they likewise can be on the flanks. The lower tail coverts show a very remarkable condition, the feathers being streaked with black, and with rufous of a tint not occurring on that region in either Mallard or Black Duck.

The middle line of the back is typical *obscura*, the rump, however, is almost black, with a greenish gloss. The scapulars are vermiculated, and the arrow-shaped tertials are of the rich grayish brown of the Mallard. With this parent also the rest of the wing agrees, the speculum having the white frame of that species. The two middle tail coverts are curly, but the general color of the tail closely resembles that of the *obscura* parent. The legs and feet, in the dried skin, are light yellow.

To sum up: undoubted Mallard characters are, (1) green on the head; (2) chestnut breast band; (3) white wing markings; (4) tertials; (5) curly tail coverts; (6) color of legs and feet. Black Duck characters are: (1) color of crown, cheeks and neck; (2)

dark belly; (3) color of median region of back and tail. One character, the reddish markings of the lower tail coverts, appears for the first time in the hybrid.

2. MALLARD (*Anas boschas*) \times BLACK DUCK (*Anas obscura*).

Museum of Comparative Zoölogy, No. 35638. Greene-Smith coll., No. 631, ♂; Long Island, N. Y. This is a mounted specimen, and has no date.

Crown, from bill over top of the head, dark brown, the feathers edged with yellowish brown. Sides of head and foreneck brownish yellow, or buffy, with dusky spots, exactly as in *obscura*. A well marked postocular stripe on either side is 'Mallard green'; these stripes, however, do not meet at the back of the head; and are somewhat broken by brown feathers. There is a white collar, but it is interrupted both in front and behind. The general ground color of the breast, for a band about 3.6 in. broad, is chestnut, rather darker than in most Mallards. The belly is brownish yellow — considerably darker than in the Mallard parent.

On the breast, as in the foregoing specimen, the feathers are marked with dark brown semilunar patches. More posteriorly these markings become less numerous; and at the level of the legs they disappear. The under tail coverts are streaked with black and rufous exactly as in the specimen already described. Unlike the latter, however, the flanks in the present specimen show no trace of vermiculations. The middle region of the back is typical *obscura*; the rump, however, very dark with a greenish gloss. The wings in general, and particularly speculum, scapulars and tertials, show the characteristic Mallard coloration, while the tail is dusky, as in *obscura*. The three middle coverts are curly. Legs and feet are brownish yellow.

This specimen is strikingly similar to the one already described, showing nearly the same Mallard and Black Duck characters, as well as the same new "hybrid" character.

3. MALLARD (*Anas boschas*) \times PINTAIL (*Dafila acuta*).

Museum of Comparative Zoölogy, No. 40026, ♂. Shot on Currituck Sound, N. C., Feb. 1904, by Dr. John Bryant.

The bill in this specimen is very interesting. In color it is dark plumbeous, the nail, a stripe along the top of the culmen, and a triangular patch on either side of the mouth being black. This

coloration agrees exactly with the Pintail, but in size the bill suggests the Mallard parent, its measurements (from the dried skin) being culmen, 2.2 in.; depth at base .9 in., breadth .8 in. In adult male Mallards the culmen is about 2.3, in Pintails about 1.8.

The color of the head is a very beautiful combination of that of the two parents. The forehead and crown are dark grayish brown with scattered green feathers. The rest of the head shows a gradation between the Mallard green, and the bronze of the male Pintail. The postocular region is pure green. But the throat, sides of the head and fore neck are emerald in certain lights, and bronze when viewed in others. There is, on each side, a small semilunar white patch below the eye. The white collar also shows an intermediate condition. In front it is about .75 in. broad; but on either side it becomes broader and extends forward along the side of the neck as a narrow V-shaped stripe, about 1.75 in length. It thus approximates the white neck stripes of the Pintail parent. Posteriorly the green of the occipital region gives way to black, which in turn shades into brownish gray on the hind neck and back.

The fore breast is of the characteristic Mallard chestnut, but perhaps rather paler; but this band is only 3.2 in. broad. Posteriorly it shades into a white band, some 3.5 in. broad, which in turn gives way, on the belly, to pale gray marked with fine zig-zag lines. The under tail coverts are velvety black, the feathers elongated and pointed as in the Pintail. The flanks are pale gray, with vermiculations, but posterior to the legs there is a white patch, as in the Pintail.

The back, from neck to rump, is gray, with dark vermiculations as in the Pintail; but most of the feathers are edged with brown, a character evidently derived from the Mallard parent. The rump is very dark, almost black, and the upper tail coverts are black, the feathers edged with pale gray and rufous. This reddish tint occurs in neither parent. The tail has a decided "pin" consisting of two feathers, but these feathers are the two middle coverts, not tail feathers as in the Pintail. These elongated coverts are strongly curved upward. There are, in addition, 16 tail feathers. The scapulars are brownish gray, intermediate in tint between Mallard and Pintail, with the black scapular patch of the Pintail, though this, in the hybrid, is rather smaller than in *D. acuta*.

The tertials are broad arrow-shaped, grayish brown becoming darker at the margin, as in the Mallard. The first two tertials in each wing have the outer half black, thus suggesting the black stripes on the tertials of the Pintail. The speculum is bright metallic green, of a tint quite unlike this region in either parent. Its anterior border is of two colors, the inner half black, as in the Mallard, the outer half chocolate as in the Pintail. The posterior border of the speculum is black; and there is a white frame as in the Mallard parent.

The feet and legs are flesh colored, and agree in size, as well as in color, with the Mallard.

Pure Mallard characters in this very interesting hybrid are: (1) green of the postocular region; (2) chestnut breast band; (3) dark rump; (4) white frame around the speculum; (5) curliness of upper tail coverts; (6) size and color of feet and legs. Pure Pintail characters are: (1) color of the bill; (2) bronze on the head; (3) white neck stripes; (4) white lower breast; (5) presence of a "pin" in the tail, although it is not homologous with pin of *D. acuta*; (6) black scapular patch; (7) number of tail feathers; (8) long neck; (9) chestnut portion of anterior border of scapulars.

Characters appearing in neither parent, but new in the hybrid are: (1) rufous markings of upper tail coverts; (2) green color of speculum.

4. MALLARD (*Anas boschas*) \times BALDPATE (*Mareca americana*).

Museum of Comparative Zoölogy, No. 42856, ♂. Long Point, Ontario; Nov. 1898. Shot by Mr. Louis Cabot.

The bill is of a dark grayish blue, the nail black, as in the Baldpate. It also resembles this parent in dimensions, measuring along the culmen 1.8 in.; in depth at the base .75 in., and greatest width .72. This is nearly $\frac{1}{3}$ less than in the case of the adult male Mallard. In outline, also, the bill resembles that of the Baldpate, for it has its greatest breadth about midway of its length. In the Mallard, on the other hand, the greatest breadth is at the base; the bill narrows in the middle, and broadens again somewhat near the tip. The number of strainers forms another Baldpate character, there being in the mandible of the hybrid 38 on a side, in Baldpates 36 to 38, and in Mallards 49 or 50.

The crown from the bill to the occipital region and as far down

on the sides as the eyes, is chocolate brown, the feathers having dark centers which gives a peculiar spotted appearance. This color is somewhat like the crowns of immature Mallard drakes, but does not occur in the Baldpate. The postocular regions on either side are Mallard green; and these stripes join at the back of the head, and extend down the sides of neck for about .5 inch. There is a stripe of Mallard green, mixed with brown and buffy feathers, about .3 in. broad running from the eye down to the throat. The sides of the head, posterior to this stripe and below the postocular patch, are cream-colored with a few black and green feathers, as in the adult male Baldpate. The remainder of the head, throat, and fore neck are pale yellowish brown or buffy, thickly spotted with green feathers. There is no white collar; but the breast is of the characteristic Mallard chestnut, a color totally distinct from the salmon tint of the corresponding region of the Baldpate.

The band is about 3 inches broad and passes posteriorly into white. The belly is white, washed with pale reddish, a character appearing at times in various of the river ducks, and probably due to external causes.

From the anus posteriorly, glossy black, as are the lower tail coverts. The sides are gray, washed with pale reddish, and with darker vermiculations. The flanks are white. Thus the color pattern of the sides and belly agrees with that of the Baldpate parent, while the color of the sides is intermediate between the two species.

The median region of the back is gray as in the Mallard. But the shoulders and scapulars are distinctly tinged with salmon color, a Baldpate character. The rump is very dark, with greenish gloss. The upper tail coverts are light gray, much lighter than in the Mallard, many of the feathers being edged with dirty white. Unfortunately this region is so badly shot that it is impossible to tell whether any of the coverts were curly. The two middle tail feathers are pointed, and longer than the others, as in the Baldpate.

The scapulars are strongly vermiculated; the inner tertials are plain, as in the Mallard, but the outer ones have the outer half black, with a narrow white margin, as in the Baldpate. The speculum is of the purple tint characteristic of the Mallard; with

black frame and white bars as in that species. This pattern is very different from the Baldpate speculum. Immediately anterior to the speculum is a large light gray patch, apparently the remnant of the white patch on the wing of the Baldpate. The legs and feet are yellowish.

To summarize: Pure Mallard characters of this specimen are: (1) green color of the postocular region, the emerald tint being very different from the lighter green on the head of the male Baldpate; (2) chestnut breast; (3) dark rump; (4) speculum and white frame; (5) color of legs and feet. Baldpate characters are: (1) color, size and shape of bill; (2) cream-colored cheeks; (3) white belly; (4) salmon tint on shoulders; (5) black markings on tertials; (6) light patch on the wing. There are no new characters appearing in this hybrid.

Without endeavoring to draw any conclusions from the inheritance of the parental characters — indeed the material is far too scanty — I may call attention to one or two striking results. There are four Mallard characters appearing in all of the hybrids. These are the chestnut breast band, the white frame about the speculum, the dark rump, and the presence of 'Mallard green' somewhere on the head. Likewise the color and size of legs and feet agree with the Mallard in both the cases in which the two parents differ in this respect. The curly tail coverts, likewise, appear in three out of the four cases, and may very probably have been present in the fourth. On the other hand, size, shape and color of bill agree with the other parent, in both cases where the two differ in this character. Finally, the new characters appearing in the hybrids are worthy of special attention. These are two, the green speculum in the Pintail hybrid, and the rufous markings on the lower tail coverts in both Black Duck hybrids. The first of these, being an iridescent color, may perhaps be really the manifestation of intermediate structure. The second is not easy to explain.

THE BIRDS OF CUSTER AND DAWSON COUNTIES,
MONTANA.¹

BY E. S. CAMERON, F. Z. S. L., M. B. O. U.

Plates XV and XVI.

92. *Phalænoptilus nuttallii*. POOR-WILL.—Common in both counties. Arrives from the middle to the end of May. I have not heard it call after the end of August. Poor-wills begin to fly about at dusk and are seldom seen, but on every ranch "those shadowy birds, consorts of bats and owls, — those scarce-embodied voices of the night," are heard during June and July. The Poor-will would rarely be seen by daylight without a dog to start it from the long grass and sage-brush in which it lies. On May 27, 1894, a collie flushed three together on Ten Mile Creek, Custer County, when two were shot by a 'tenderfoot' which proved to be both females. Each contained an egg which in one was ready to lay. Poor-wills bred upon my ranch near Terry, and in 1898 the young could fly on August 21. They visited the water-troughs at my ranch in Dawson County of an evening, and on June 9, 1906, three alighted on the hitching post about 7.30 p. m. Here two fought while the third looked on, the combatants uttering their cry of poor-will and a peculiar booming or croaking which differs from the noise made by the Nighthawk. Unlike the eggs of the latter, those of the Poor-will are scarcely ever seen; the bird seems to possess an unusual instinct for laying them in out of the way places. On June 26, 1907, Mr. M. M. Archdale flushed a Poor-will from her two white eggs on a steep hill-side in some rough pine brakes at his ranch near Knowlton. In this unfrequented place the eggs were fully exposed on the bare earth amidst the pines. On June 28, we went together to the place intending to photograph the eggs, but they had been already removed by the bird.

93. *Chordeiles virginianus henryi*. WESTERN NIGHTHAWK.—Abundant. Ubiquitous in both counties. Arrives, on an average, in the first week of June, and leaves during the first week of September. By the end of August Nighthawks are very scarce. On June 28, 1903, sixty-nine of these birds passed me flying west at 6:30 p. m., when riding at my ranch in Dawson County. During July, 1905 and 1906, from fifty to sixty might be counted almost any evening from the door at the same place. Their manner of flying was to give twelve rapid wing beats and then sail in circles. Nighthawks lay their two eggs in any open situation in the badlands or on the prairie indifferently. They probably rear two broods

¹ Continued from p. 270. For maps of the region see maps facing p. 244.—*N. B.* On map of Dawson County, for "Scale, 12 miles=1 inch" read Scale, 18 miles=1 inch. On map of Custer County, for "Scale, 12 miles=1 inch." read 19.4 miles=1 inch.

in the year, as I have found both eggs and full-feathered young at the end of July. The male assists in the duties of incubation. Young full-feathered Nighthawks, before they can fly, have chestnut and black upper parts, black primaries with narrow buff margins, and are pale buff beneath. The mother gives a call of *cheep cheep* when she thinks her nestlings are menaced and performs extraordinary antics.

94. *Aëronautes melanoleucus*. WHITE-THROATED SWIFT.—Rare. Transient. Mr. Dan Bowman has observed this bird on the Powder River, Custer County. I have not seen it.

95. *Trochilus colubris*. RUBY-THROATED HUMMINGBIRD.—Rare. Mr. Dan Bowman has described Hummingbirds to me observed by him at different times in Custer County, which undoubtedly belonged to this species. He thinks that in the summer of 1888, a pair nested on his ranch by the Powder River, as they were seen about the garden for six weeks attracted by the petunias, four o'clocks, and marigolds which grew there. Miss Mildred Myers recollects that about seven years ago a pair of Ruby-throated Hummingbirds nested in a clump of rose bushes at Miles City, where the residence of Senator McLean is now situated. She frequently saw the nest, which contained two pearly white eggs about the size of peas.

96. *Stellula calliope*. CALLIOPE HUMMINGBIRD.—Rare. Mr. Dan Bowman informs me that a male of this species was several times seen by him and his wife, to hover over a bed of flowering sweet peas at Knowlton, Custer County, in September, 1899.

Mr. F. Z. Gray states that some years ago a pair of Calliope Hummingbirds nested at the Mason ranch, situated between the heads of Sheep and Trail Creeks, being attracted by the numerous flowers in Mrs. Mason's garden.

97. *Tyrannus tyrannus*. KINGBIRD.—Common in both counties on the river valleys. Scarce in the pine hills excepting on the spring migration when small flocks may be seen. Kingbirds arrive about the middle of May, but, as with Say's Phoebe, the time of arrival is irregular. They were more common on my ranch near Terry, Custer County, than I have noticed them elsewhere, and are late breeders, the newly fledged young first appearing at the end of July. Kingbirds nest in the wild fruit trees, box elders and young cottonwoods, generally at a low altitude. In 1900, a pair of Kingbirds built their nest in a box elder tree close to that of the Marsh Hawk on the ground, and by their persecution distracted her attention from any intruder. In this they did me good service, by preventing her from stooping at my head, but they harried the poor hawk to such an unmerciful degree that it was a complete mystery how she could endure such attacks patiently. However, the Kingbirds were none the worse. The passiveness with which large hawks will submit to aggressive Kingbirds has always astonished me, and it must be assumed that their feelings alone are hurt by the persecution. The Kingbird alights on the back of Swainson's Hawk, remains there pecking at it for a couple of seconds, and, no matter how high the hawk may soar, the small aggressor will keep above

it renewing the attacks at intervals until both are lost to view. The hawk responds to each assault by merely giving sluggish downward flaps when it again soars on motionless wings as before.

98. **Tyrannus verticalis.** ARKANSAS KINGBIRD.— Abundant summer visitor. Ubiquitous in both counties; nesting in all kinds of trees, at any elevation indifferently. Arrives about the middle of May, young are generally fledged about the middle of July, and by Sept. 20, all the birds have left. Arkansas Kingbirds lay from three to five eggs and, like the next species, occasionally steal the nests of other birds. One pair drove away two robins and took possession of their nest. On July 8, 1893, I made the unusual discovery of these Kingbirds nesting in a colony on a fork of Whitney Creek, Custer County. The nests were placed in the forks of young cottonwoods, some contained eggs and others young birds nearly ready to fly. The male indulges in a curious display when courting the female. He makes successive darts in the air, fluttering, vibrating his quills, and trilling as he shoots forward. Propelling himself thus for several hundred yards, he looks like a bird gone mad. This species shows equal courage in attacking the Raptore as the last mentioned. On July 12, 1904, as my wife and I were driving through cottonwoods on the Yellowstone, a young Sparrow Hawk rose from the ground which was immediately struck down by an Arkansas Kingbird before it could clear the trees. I picked up the dazed hawk and took it home when next day it was sufficiently recovered to fly about half a mile before alighting. This showed that the hawk had not fallen from weakness, but from the force of the onslaught.

On July 1, 1905, we watched an Arkansas Kingbird attack a female Red-tailed Hawk which was disturbed from her nest in a cottonwood. The Kingbird constantly alighted upon this powerful hawk, once upon her head, and pecked her repeatedly, while the latter made no attempt to retaliate, but merely flew in circles uttering her quavering scream.

99. **Sayornis saya.** SAY'S PHOEBE.— Common summer visitor. Arrives at any time between April 5 and April 30. This bird, like Cliff Swallows, adopts the two extremes of nesting about buildings and in remote badland solitudes. Unlike the latter it shows small discernment in the choice of a site, the nests are placed on or against logs under low eaves, or on any convenient ledge, where the young must inevitably fall victims to ranch cats. If for any cause compelled to desert the first nest, Say's Phoebe will build a second in another similar situation. Five eggs are laid. A pair of these flycatchers made a peculiar unattached nest on a slanting board at the back of my house in Dawson County, and ingeniously built up the lower end to make the inside level. As usual this nest was at such a low elevation as to be at the mercy of any predatory animal. While these birds excel as architects and make substantial nests of grasses and fine roots lined with such material as wool and feathers, they are not above appropriating the nests of other species. In this latter case they can rear a brood safely. In May, 1895, a pair took possession of a Barn

Swallow's nest in the stable and forced the rightful owners, which were renovating it, to build an entirely new one affixed to a beam. In 1904, a pair of Say's Phoebes nested below the eyrie of the Golden Eagles and were unmolested. Another pair which, in 1906, built in a hole near the Prairie Falcon's eyrie (on one of the highest buttes along the Yellowstone) were killed by the latter for their young. In May, 1907, a still more remarkable site chosen by these flycatchers was the old abode of a Cliff Swallow; one of several nests situated above a wolf-den in a huge sand rock. The den was inhabited by a she-wolf with her six pups, and the birds were exposed to constant disturbance, both from these animals and from men who suffocated the young wolves with a pitch pine fire. The she-wolf escaped with one ten weeks-old pup and intermittent efforts were made to trap her at the den. Nevertheless the flycatchers did not desert their nest.

100. **Contopus richardsonii**. WESTERN WOOD PEWEE.—Rare. My wife has twice seen a single bird which came to our water-troughs in Dawson County, on March 21 and April 6, respectively, 1904. A pair was seen by me near Knowlton, Custer Co., on May 10, 1907. Captain Thorne gives this species as "Common. Breeds."

101. **Empidonax trailli**. TRAILL'S FLYCATCHER.—Rare. I observed a specimen in the shrubbery at my north window (Custer County), on May 18, 1894, and another remained there from May 11 to May 19, in 1896. Captain Thorne took one specimen on June 8.

102. **Empidonax minimus**. LEAST FLYCATCHER.—Rare. I saw an example of this flycatcher in the brush at my north window (Custer County) on May 25, 1893, and another on May 18, 1894. Captain Thorne gives it as "Not common."

103. **Empidonax hammondi**. HAMMOND'S FLYCATCHER.—Rare. I have not observed this bird. Captain Thorne obtained "two specimens — an adult July 17, and a young bird June 8."

104. **Otocoris alpestris arenicola**. DESERT HORNED LARK.—An abundant resident; ubiquitous in both counties. Immense flocks, which may number five hundred birds, reinforce the residents at the end of February. Of all prairie birds Horned Larks are the first to breed. I have seen their grass nests in depressions of the plain as early as the latter part of April; also at the end of June, showing that two broods are reared. Later nests are often lined with down from the pollen of a small daisy common on the prairie. Four eggs are laid and as was pointed out by Coues in 'Birds of the Northwest' (1874), both sexes share the duties of incubation. Newly fledged young run in the road ruts like their parents, and are sometimes trodden on by horses before they can fly. At this age they are sprinkled all over with white dots above and may be easily recognized. When her fledglings seem in danger the mother flies to, and runs from them, alternately, to induce them to follow her away. In winter Horned Larks frequent ranch buildings in search of food which they find in the hay stacks or in the droppings of cattle and horses. At this time cold and starvation render them so tame that they can be easily caught. (See Chipping Sparrow, No. 143.)



FIG. 1. YOUNG MAGPIES IN THE BADLANDS.



FIG. 2. PIÑON JAY'S HAUNTS ON COTTONWOOD CREEK, DAWSON CO.,
MONTANA.

In the fall of 1889, Captain Thorne "sent one hundred and eighteen skins of birds taken every month in the year, to the American Museum of Natural History, New York. They were examined by Dr. Jonathan Dwight, Jr., and pronounced to be "all *arenicola*."

105. *Pica pica hudsonica*. AMERICAN MAGPIE.—Common. More numerous in Dawson County than in Custer. Abundant in Custer County during the early nineties, where it was a source of much annoyance to trappers until exterminated by poison and traps put out for wolves. Increasing again now, in Custer County, during the last five years, especially around Knowlton, from a single pair which is believed to have come from Dawson County to Mr. J. H. Price's ranch. They nested at the latter place in 1902, and on February, 21, 1907, I counted eighteen Magpies in one of Mr. Price's pastures. Two pairs of Magpies nest annually on Cottonwood Creek which runs through the badlands near my ranch in Dawson County. There are altogether seven nests here, but three only have been used in the last four years. The broods number six or eight, and can fly by the middle of June. The full-feathered fledglings sit in the tree and have a habit of incessantly bobbing, or bowing, which renders them difficult subjects for the photographer. When the young birds think that the parents are away too long they keep up a monotonous clamor upon one note, precisely like the young Piñon Jay's shriek. Magpies perch on cattle for the 'warbles' which infest the hide, and also alight on the backs of horses and of the mule deer. The latter do not seem to appreciate this attention, and I have seen a doe push a Magpie from her back with her nose. I have found the Magpie to be one of the tamest birds in eastern Montana. On August 4, 1904, I approached within four yards of one sitting on a bush of the so-called yellow sage in the badlands. If encouraged about ranch buildings there is no limit to the boldness of this precocious thief.

106. *Corvus corax sinuatus*. AMERICAN RAVEN.—Rare. An occasional straggler to both counties. I have seen about half a dozen in 18 years. Mr. J. H. Price has not observed it. When on a hunting trip in 1898 a pair were twice seen; on Nov. 21 (on Cherry Creek) and Dec. 19 (on Cedar Creek) in Dawson County. At the latter date I had made a long and fatiguing crawl towards some recumbent antelope in high sagebrush when the low flying Ravens spoilt my stalk by frightening the timid game. Captain Thorne gives the Raven as "not common" but Dr. Edgar A. Mearns records it as "common" in his list of birds of Fort Custer. (Condor, Vol. VI, p. 21.)

107. *Corvus cryptoleucus*. WHITE-NECKED RAVEN.—Rare. One seen by my wife and Mrs. Gifford at the Gifford residence, Fallon, Custer County, on Sept. 14, 1902. It was flying south within range of a 16-bore gun.

108. *Corvus americanus*. AMERICAN CROW.—Not common. An irregular spring migrant in both counties. I saw a large flock on April 29, 1894, at my ranch in Custer County, but it is generally seen in small numbers.

In April, 1904 (as Mr. J. H. Price informs me), J. Anderson of Sheep Creek (Custer County) had much trouble in corralling his horses owing to a large flock of crows which alarmed the animals by cawing in the pines. Mr. F. Z. Gray saw a flock of forty crows at Knowlton on March 31, 1907. As far as I can learn the crow has not nested in either county since 1885, but old nests may still be seen (April, 1907). Fifteen, which are in Mr. Dan Bowman's pasture on Sheep Creek, are situated in ash trees about fifteen feet from the ground.

109. *Cyanocephalus cyanocephalus*. PIÑON JAY.—Common in the pine hills of both counties. Occurs sporadically in roving flocks of from fifty to a hundred individuals in fall, but at least one resident flock inhabits the tract of rough country, some four by eight miles in extent, which is drained by Cottonwood Creek in Dawson County. (See Auk, Vol. XXIV, Plate VII.) This is an area of pine hills and badlands combined, practically impassable on horseback, and contains in its secure recesses not only the eyrie of the Golden Eagles, but, where bounded on the south by the Yellowstone, one of Prairie Falcons as well.

Here, where the buttes rise sheer from the water's edge, the Piñon Jays may be seen on the high peaks, either walking about the cliff or flying slowly along its precipitous face, when they strongly recall the Jackdaws of Great Britain. The same flock constantly frequent my ranch and drink regularly at the water-troughs, where their blue plumage against the green cedar background has a fine effect in bright sunshine.

When actually in the trees, Piñon Jays are hard to see on account of the thick branches, but being restless birds they constantly pass and repass through the scattered pines in straggling flight. Although their ordinary pace is slow, they can, when they like, fly very swiftly. Their presence is always proclaimed by their shrill cry of *wī-ār whäck, wī-ār whäck*; the last note short, but the first two notes long and high pitched like the caterwaul of a cat. Should a flock be disturbed when feeding in the pines, the first bird taking wing will warn the others by this cry, when they will follow leisurely, one at a time, until all are in flight and calling, the last to leave, however, being a long way behind the first. When flying to water they act in much the same manner. Piñon Jays have also a single call, like the cry of the young but harsher, and (as pointed out by Mr. Ridgway)¹ another "peculiar querulous note" like that of the Magpie in the love season.

That the cry of the young birds, both in and out of the nest, is precisely similar to that of young magpies, I can assert from my own experience, having been able to compare both at the same time. Although at the time of writing (April, 1907) only two nests of the Piñon Jay have been discovered, it is evident that many pairs must breed here, for I have seen and watched numbers of the newly fledged young which could only just

¹ North American Birds, by Baird, Brewer and Ridgway, Land Birds, Vol. II, p. 261, 1874.



FIG. 1. THE LAST PIÑON JAY FLEDGLING IN NEST.



FIG. 2. NESTING SITE OF SAY'S PHOEBE ABOVE A WOLF DEN.

fly across the gulches. The two nests mentioned were about four miles apart, and so far, I have found no evidence of the birds breeding in colonies here, as in the mountains, but judging from the size of the flocks it would appear that they undoubtedly do so. The paucity of nests met with is readily explained by the impenetrable nature of the country to be explored.

One of the above mentioned nests was only two miles from my ranch so that I was able to keep the birds under observation. The pair were first noticed to be carrying twigs on May 19, at which date the nest was about half-finished, both birds assisting in its construction. Without the guidance of the birds it is unlikely that I should have found the nest at all, placed, as it was, near the extremity of a thick pine bough and completely screened from observation except from above within the tree. The nest was of large size with a smaller interior cup, the whole of the exterior, together with a platform on which the cup rested, being composed entirely of dead greasewood sticks and a few rootlets. The width across the sticks was 14 inches, and the height of the nest 8 inches. The cup was very strongly made of dead grass, pulled by the birds into a material like tow, and so thickly matted together, that it remained intact when nearly all the surrounding sticks had been blown away. Some dead thistle leaves were woven into the rim. The inner cup was $5\frac{1}{2}$ inches in diameter and $2\frac{1}{2}$ inches deep. Although no clay was used in its manufacture the cup at first resembled the white clay lining of some nests and thus afforded charming contrast to the eggs in their bower of pine needles. By the time that the young were hatched the cup had turned from white to brown. The female began to lay apparently on May 24, as she was sitting on five eggs on May 28. To the best of my belief, both birds share the duties of incubation. The ground color of the eggs is pale greenish, spotted, streaked, and clouded with reddish brown and purple. As seen in the nest they are indistinguishable from handsome eggs of the Blackbird (*Turdus merula*). The naked slate-colored young were hatched on June 15, so that the time of incubation was about 18 days. They are fully feathered at two weeks old, being then a uniform lavender of exactly the same color as the flower of that name, with bill, legs, and feet to match. This hue is darkest on the quills and lightest on the crissum. After leaving the nest they became more ash gray, lighter below; the tail is then dark slate with a light tip, and the ends of the primaries almost black. Until after the fall moult the birds show no real blue. The irides are hazel. The adult female is a pale lavender blue, with the head blue; the male is a darker, more uniform blue. As pointed out by Coues¹ this blue is "very variable in intensity."

I regret to record that these interesting, but unfortunate, nestlings were hatched only to meet with a cruel fate, for on the very day after emerging from the shell (on June 16), they began to disappear at intervals, one after another, in a most perplexing manner. At first I attributed their loss to the violent gales which swept over the country, uprooting many pines,

¹ Key to North American Birds, p. 418, 1887.

but, on July 2, when only one full-fledged bird remained out of the five, I recognized the work of some other destructive and more mysterious agency. As there was no trace of the nestlings on the ground near the tree, and the nest was invisible from the outside, it was my belief that winged marauders, such as Marsh Hawks, must be responsible, although none of their kind had been seen near this badland grove. Certainly there were Sparrow Hawks, but the massacre of these innocents seemed alien to their habits when grasshoppers swarmed, as at the time in question. Wishing to save the last Jay fledgling and, if possible, solve the mystery, I sat down to watch with my field glasses on a deer trail where it wound near the summit of a steep distant butte. After a long wait my patience was rewarded by seeing a pair of Northern Shrikes fly straight to the Jays' tree. On this occasion the parents were at hand, and, assailing the miscreants with sharp cries, compelled them to retreat. I held the key, however, to this tragedy of the badlands, and I felt convinced that the sole survivor would untimely follow its brothers and sisters.

Piñon Jays subsist chiefly on pine seeds, which they extract from the cones, and also on the soft embryonic cones themselves, detaching these with their tapering bills from the tasselled parent stem. Like Magpies, however, they are practically omnivorous, and a Piñon Jay has been known to meet its fate in a wolf trap by which destructive instrument so many of the former have perished. Like Magpies, too, Piñon Jays come about the ranch house in the hope of receiving scraps from the table, alighting but two or three yards from the door, or on the hitching post where the horses are tied. They are also very fond of insect food, and may be seen walking about as they turn over dried cattle manure in search of coleoptera. Mr. Dan Bowman informs me that in his locality (Knowlton) soft corn on the cob has a great attraction for them.

It is an interesting sight in June, to watch a flock of some hundred or more Piñon Jays which contains a large proportion of the newly fledged young. After the latter can fly well they still expect the parents to feed them, and clamor incessantly to be fed, repeating their shrill monotonous cry of *wauck* on a single note, whether on the ground or in the pine branches, voracious, open-mouthed fledglings walk towards the parents, flapping their newly acquired wings to attract attention. The old birds may then be seen supplying them with grubs and insects. I observed one female feed a single offspring on the ground several times in a few minutes. In midwinter, Piñon Jays seek deep ravines and love to sun themselves either on a bank or in the branches of low cedars which grow there. When thus sheltered these noisy, restless birds will sit motionless for some time without calling to each other. At this season their food seems to consist entirely of cedar berries.

110. **Molothrus ater.** COWBIRD.— Abundant summer resident of both counties, arriving in April. The manner in which Cowbirds associate with horses and cattle is no less interesting than remarkable. I have often noticed at my ranch (Custer Co.), when a saddle horse was turned loose,

how numbers of previously unseen Cowbirds would suddenly appear from space to perch upon him and run up and down on his back. Horses are corralled here which are covered with Cowbird excrement, and on June 3, 1894, I drove up my saddle horses with seven Cowbirds perched on the back of one of them. My neighbor, Mr. H. H. Tusler, has caught Cowbirds on horses with his hands.

In summer, when a bunch of cattle is driven to some outlying pasturage, Cowbirds often follow the drove for the whole distance, alighting constantly upon, or just in front of the animals. Many times it seems as if the birds cannot avoid being trodden on, but they just manage to run out of the way in time. Occasionally, the Cowbirds leave the cattle to dart after flying locusts which they catch very cleverly with their bills.

It would seem that Cowbirds sometimes attach themselves to particular cattle, follow them wherever they wander, and drink when they go to water. I noticed young Cowbirds, in August, 1905, which were inseparable from certain cattle of mine for at least a week. Two of these birds were quite buff in color with dusky streaks and easily distinguished.

I have found Cowbird eggs in the nests of the Long-tailed Chat, Brewer's Blackbird, Arctic Towhee, Vesper Sparrow, and Chipping Sparrow. I have seen them more frequently in the nests of the latter than of other species. Three Cowbird eggs are the most I have observed in any one nest. On July 25, 1896, I saw the empty, deserted nest of a Chipping Sparrow in a sage bush a foot from the ground. Underneath lay an egg of the sparrow and one of a Cowbird. For an exhaustive account of the parasitic nesting habits of the Cowbird in this region see Coues's 'Birds of the Northwest,' p. 181 *et seq.*, 1874.

111. *Xanthocephalus xanthocephalus*. YELLOW-HEADED BLACKBIRD. — Tolerably common on migration, but the least numerous of the blackbirds which come here. Yellow-headed Blackbirds arrive about the first week in May and have disappeared by the end of September. They are also seen in the pine hills. Flocks which frequented the haymeadow, haystacks, and corrals in the fall at my ranch in Custer County consisted chiefly of immature birds. While the adult male presents such a splendid appearance, the immature young also show striking variations of plumage. One of these shot among other species of blackbirds in the corn on August 19, 1898, was colored as follows: The throat from the base of the bill was bright yellow, which extended to the breast, this color being divided from the chestnut sides of the head by a coal black patch under and including the eye. The crown, hind neck, and all other parts were black except some yellow feathers at the vent. The irides were hazel and the bird was ten inches long. Yellow-headed Blackbirds nest at several localities in Custer County. On June 17, 1905, my wife found these birds numerous at Brackett's ranch on Whitney Creek, and was told that they were nesting in the vicinity.

112. *Agelaius phoeniceus arctolegus*.¹ RED-WINGED BLACKBIRD.—

¹ See Oberholser, Auk, Vol. XXIV, p. 332.

Common on migration in both counties, arriving about the end of April, but more scarce in the breeding season as there are few suitable nesting sites. Large flocks visited my ranch (Custer Co.) in 1893, which were very destructive to the squaw corn, and destroyed all the corn (in the milk) belonging to a neighbor (Mr. H. Tusler) who was forced to cut it for fodder. These flocks seemed almost entirely composed of females and young birds, and seven which I examined were all immature examples. There was a small proportion of Brewer's Blackbirds and Bronzed Grackles among them. The Red-winged Blackbirds were never so numerous at any subsequent period while I lived on this ranch, owing to the fact that in the same year (1893), a pair of Marsh Hawks established themselves below the house and returned each succeeding spring. Both parents hunted incessantly to supply their young with food; together, or separately, they would beat the hillsides flying up and down the creek on which the two ranches were situated. This kept the blackbirds constantly on the move.

Like Brewer's Blackbird the Red-winged chooses all kinds of positions for its nest, and will sometimes place the latter as near the ground as the coarse slough grass will permit. A pool by the Yellowstone, about two miles east of Terry, used to be frequented by a colony of these blackbirds whose nests, interwoven with four or five growing flags and suspended two feet above the water were a pleasure to behold. On June 11, 1894, both fresh eggs and young birds were found; four eggs being the greatest number laid in one nest. Another nest observed on my ranch (Custer Co.), at the same time, and placed a few inches from the ground in a wild currant bush, was most inferior to the above charming style of bird architecture. On this ranch several pairs of Red-winged Blackbirds bred every year in a wet meadow, but reared very few young on account of the Marsh Hawks. On June 8, 1900, there were six nests; five in slough grass, which was here preferred to bulrushes, and one in a wild rose bush. The deep nests were made chiefly of the coarse marsh grass, which is called 'slough grass' here, and contained either four or five eggs. Unlike Brewer's Blackbird, the male of this species becomes most aggressive when the young are full fledged, and will strike an intruder on the head, constantly uttering a loud clucking. The newly fledged young hide in the slough grass and whistle softly. The Red-winged Blackbird has a short, charming song of five notes, in liquid quality of tone more nearly resembling a flute than that of any bird I know.

113. *Sturnella magna neglecta*. WESTERN MEADOWLARK.— Abundant summer resident. Ubiquitous in both counties.

From records kept over a period of eighteen years the average date of spring arrival is shown to be March 30, and of the fall departure October 20. The earliest appearance was March 20, 1907. The Meadowlark is always eagerly awaited here as the herald of spring, and, in the first week of April, pours forth its loud song from every conceivable situation. This has several different passages, but the usual song, which delights ranchmen, consists of a repetition of seven notes — the first long and the other

six short (two triplets). The birds' varied motives could be very easily rendered by musical notation, which I presume has already been done. Meadowlarks also sing on the wing, during rain and snowstorms and at night. I have seen three rival males singing against each other on the ground. Of the Western Meadowlark's song Dr. J. A. Allen¹ has written: "It differs from that of the Meadowlark in the Eastern States in the notes being louder and wilder, and at the same time more liquid, mellow, and far sweeter. They have a pensiveness and a general character remarkably in harmony with the half-dreary wildness of the primitive prairie, as though the bird had received from its surroundings their peculiar impress; while if less loud their songs would hardly reach their mates above the strong winds that almost constantly sweep over the prairies in the hot months."

Meadowlarks make their nests entirely of grass under the sage-brush or in tussocks of grass, and roof them over with the same material. They have either five, six, or seven eggs, beginning to lay about May 20, and sometimes rear two broods. On June 30, 1906, I noticed a bird sitting in a flowering cactus patch which was the prettiest nest I have seen. By the middle of June the young Meadowlarks can fly. In these the yellow is quite pale, but there is not much difference between the adult male and female save that the yellow at edge of wing is paler in the latter. Early in September the Meadowlarks collect in flocks on the open prairie when I have counted as many as fifty together. At my ranch in Dawson County, Meadowlarks are very fond of bathing in the overflow of the troughs with the other birds, and become the wettest of any. Several times individuals were observed which could scarcely take wing, and on August 14, 1904, my wife saw a Meadowlark incapable of flight after its bath.

Meadowlarks have many enemies, more especially Golden Eagles, Prairie Falcons, Marsh Hawks, and Red-tailed Hawks. A pair of the latter, which nested for several years, close to my ranch in Custer County, fed their young almost entirely upon these birds. Whereas heaps of Meadowlark feathers lay on a log near the tree, other remains were scarcely ever found, although the hawks did occasionally procure snakes and cotton-tail rabbits.

Numerous Meadowlarks reared their young in the vicinity of the buzzards' haunt, and this fact, conjoined to the unmistakable evidence that the Meadowlarks formed the staple bill of fare, had probably something to do with the site chosen for the nest.

On June 15, 1898, I surprised the female hawk just after she had seized a newly flown Meadowlark which was immediately dropped. Mr. M. M. Archdale has seen a female Marsh Hawk standing by a Meadowlark's nest and devouring the young birds. I have several times found Meadowlarks impaled, or hanging, on a barbed wire fence, and a few perish from the buffeting of spring storms. Mr. Dan Bowman took one of these storm-tossed birds into his house where it soon recovered, and, becoming ex-

¹ As quoted by Dr. Coues in 'Birds of the Northwest,' p. 191, 1874.

tremely tame, would fly after him wherever he went out of doors. It seemed likely to remain during the winter, but the migratory impulse was too strong and the Meadowlark left at the end of October. Nevertheless, like Brewer's Blackbird, the Meadowlark does sometimes stay for the whole winter. During the last winter, 1906-1907, no less than seven Meadowlarks remained on Mr. Al. Jordan's property situated on the outskirts of Miles City.

114. **Icterus bullocki.** BULLOCK'S ORIOLE.—Common summer resident of both counties on all the wooded rivers and creeks flowing through prairie country. Migrant stragglers occur in the pine hills, but I have not found Orioles nesting within this area. According to my notes, Orioles arrive about May 20, and have eggs by the middle of June. Females appear to arrive first. At my ranch in Custer County, where they nested, the Orioles used to make a loud chattering at 4 A. M., which might be continued until 6, during the end of May. On the Yellowstone their nests are suspended at a great height, often from upright branches, at the top of immense cottonwoods. They are usually made of horse hair, copiously lined with cotton down from the trees, and four or five eggs are laid. In marked contrast to the above, the nests on small, tributary creeks are only a few feet from the ground. Two nests may be found in one small cottonwood here, but Dr. C. Hart Merriam¹ quotes Captain Bendire who saw "as many as five occupied nests on a single small birch tree" at Fort Lapwai in Idaho.

115. **Scolecophagus carolinus.** RUSTY BLACKBIRD.—Rare. On April 26, 1903, I surprised a Sharp-shinned Hawk, which had just killed, and had commenced to eat, a Rusty Blackbird on my ranch in Dawson County. I took this specimen home, which was the only one I had seen hitherto. Later in the day my wife saw a small flock of seven or eight Rusty Blackbirds in the same locality.

116. **Scolecophagus cyanocephalus.** BREWER'S BLACKBIRD.—Abundant summer resident in both counties, arriving in April. In the fall immense flocks, which are largely composed of females and young, occur in prairie country, river valleys, and in the open parks amidst the pine hills. This is one of the tamest birds on ranches, even alighting on the veranda. Occasionally single individuals remain for the whole winter about the buildings. Brewer's Blackbird usually nests in small colonies, either in cottonwood trees or bullberry bushes fringing the creek banks, but also in single pairs upon the ground. In the latter situation the nest is placed under the sage-brush, or any small bush. A colony in bullberry bushes, growing by water, at a fork of Coal Creek (Custer Co.), had nests in every stage of progress, on June 28, 1905. Some were only just finished, while others contained nestlings; a few again held both eggs and young. Further on, newly fledged blackbirds were seen which presumably belonged to a first brood. These are of a uniform umber brown with bill, legs, and

¹ Results of a Biological Reconnaissance of south-central Idaho, p. 101, 1891.

irides dark brown. Brewer's Blackbird lays from five to seven eggs here, and, as, when building in trees, the vertical height of the bulky nest greatly exceeds the diameter, there is only just space for the latter number of eggs. The nests are made of grasses and stalks lined with mud. A flock of about a thousand blackbirds, entirely composed of this species, remained with Messrs. Udem's sheep on Bad Route Creek, Dawson County, during September, 1906. At daybreak, as the sheep gradually rose on their bed-ground, the dusky host swarmed over their backs to search for the ticks which infested them. Messrs. Udem informed me that both the Yellow-headed and Red-winged species sought their woolly charges for the same purpose, but in less numbers. This was the largest gathering of blackbirds that I had ever seen. The latest date on which I have observed them here was October 6, 1898, when a flock was washing in water partly frozen over.

117. *Quiscalus quiscula æneus*. BRONZED GRACKLE.—Common summer resident of both counties, in prairie country, arriving about the end of April. Casual in pines and badlands. This is a very tame, unsuspicious bird, alighting on the veranda, and being easily caught unhurt, if traps are set for it. In the two years 1895 and 1896, the date of the first arrival at my ranch (Custer Co.) was April 25. In both instances an adult male flew into the stable where it was caught, and examined, before being liberated. In these early arrivals, the upper back only was bronze, the head and neck green and blue, while the other parts, including the tail, were black. When alarmed, the birds spread their tails like a fan. An average male grackle measures a foot long, seventeen inches in extent, and weighs four ounces.

These birds nest here in the holes, or hollows, of dead trees, so that their nests are generally invisible from the outside. However, on June 1, 1893, Mr. H. Tusler showed me a nest of this species placed in a hollow formed by the fork of the two main branches of a box elder. Although well protected on all sides by wood, it was possible to examine this nest, which was only six feet from the ground, and made entirely of slough grass, with a thick, internal layer of mud. It contained six lovely eggs; a water color drawing alone does them justice.¹

In 1894, there was a small colony of grackles in the large cottonwoods on the south bank of Yellowstone, below the Terry ferry crossing. All the nesting holes were high and very difficult to reach, excepting one where the nest was in the top of a burnt cottonwood stump, about twelve feet from the ground. The birds had eggs on June 3, and young hatched out on June 11, which both parents were feeding on crane flies. The greatest number of eggs in one clutch appears to be six, and by the middle of July the young grackles are flying about with the old birds.

118. *Coccothraustes vespertinus montanus*. WESTERN EVENING GROS-BEAK.—Appears to be a rare straggler. On June 6, 1900, a male of this

¹ A lady friend, an expert water color artist, painted two of these eggs for me.

species perched in the choke cherries at the ranch veranda in Custer County, where it sung loudly for some time. This song, which I thought was very fine, attracted me to the bird. My wife also heard it in the dark room, and afterwards told me it had reminded her of a Thrasher. Nevertheless, Mr. Townsend¹ has described it as "a miserable failure." So much for different opinions.

On August 23, 1904, a male Evening Grosbeak came to my water troughs in Dawson County and allowed a near approach. Captain Thorne gives it as rare. Dr. Edgar A. Mearns² mentions that "a small flock was seen beside the Bighorn River, near Fort Custer" (which was formerly in Custer County) at the end of July.

119. *Loxia curvirostra minor*. AMERICAN CROSSBILL.—Common in the pine hills of both counties. Crossbills may be seen during every month of the year and it is certain that they breed, although I have not found a nest.

It was not possible for me to give much attention to these birds until the three years 1904, 1905, 1906, when Crossbills of all ages and plumages were regular visitors to my water-troughs in Dawson County. During the first two years above mentioned, the birds came daily, in small flocks from the end of May until the middle of December, and when mixed with about the same number of Goldfinches, presented a most attractive sight. In cold weather, the Crossbills showed their intelligence by waiting for me to break the ice, singing subdued songs meanwhile, but ceased coming altogether after snowfall. From six to twenty was the average number of Crossbills seen daily at the water, but on June 6, 1905, I counted forty-eight in two flocks, which was the most ever observed here. As is well known, these birds are very tame, and will sometimes allow an examination within two or three yards. The most striking feature about these Crossbills is the variation in their plumage. Besides the vermilion and black of the adult males (which colors are seemingly brightest in November), and the grays or greens of females and young, I have seen the following mixed plumages: Vermilion and brown; orange and brown; olive green, with underparts and rump light green; also, a tricolor of brown, green and yellow. The rarest combination of colors remarked by me is a uniform bright green with yellow on the wings. In 1906, Crossbills were comparatively scarce, but young of the year began coming to the water on June 15.

120. *Leucosticte tephrocotis*. GRAY-CROWNED LEUCOSTICTE.—Abundant winter visitor.

The average date of arrival in the vicinity of Terry is October 25, and the birds leave about March 15. This species occurs in immense flocks in both counties, but appears to be very local and capricious. I have never seen it south of the Northern Pacific Railroad. My first experience of this

¹ North American Birds, Baird, Brewer and Ridgway, Land Birds, Vol. I, p. 451, 1874.

² Condor Vol. VI, No. 1, p. 21.

bird was during the early days of February, 1893, when staying at the Macqueen Hotel in Miles City. I then observed a large flock for some days through the window; the birds remained in the cottonwood trees outside, and appeared paralyzed from cold and starvation. The weather was then terribly severe; forty-two degrees below zero had been registered on the first and second of the month. On the third instant, one of these finches, almost frozen to death, ventured into the hotel, through the front door (momentarily opened) and was captured alive. I endeavored to restore it, but the bird was too far gone, and shortly expired. When hunting mule deer in the Terry badlands (in Custer County), or in the red scoriaceous hills beyond (in Dawson County), large flocks of these birds add charm to the wintry landscape, as they balance on the tall rye grass, or whirl past in erratic curves.

Sometimes the flocks complete circles in the air, when they look like a variegated wheel of birds, or fly untiringly about the cedar thickets after the manner of Bohemian Waxwings. During snowy weather they allow an approach to within four or five yards when engrossed with grass seeds and withered dog daisies on the bare patches of the hillsides. If forced to rise, they sweep round in a dense cluster, and immediately return to the same spot — their wings making a loud, rustling noise.

Rosy Finches are very numerous at my ranch in Dawson County; I have seen about a thousand at one time by the water trough distributed in the pines and on the ground. A long stream of birds may keep flying into a draw for about a minute and be all lost to sight in the long grass upon alighting, but the same flock perched in a small dead cedar (completely covering it), is a remarkable and charming sight. The winter of 1905-06 was a great contrast to previous years, as for some inexplicable reason, no Rosy Finches appeared.

Writing of this species at Fort Keough, Captain Thorne states: "When it is cold and stormy they gather into the post by thousands. . . . They are often seen sheltering themselves in the old nests of Cliff Swallows."

121. *Leucosticte tephrocotis littoralis*. HEPBURN'S LEUCOSTICTE.—Common. I agree with Captain Thorne that this species occurs "with the last in about the proportion of one in twenty." On November 13, 1903, at my ranch in Dawson County, three remarkably tame birds came alone to the water-troughs.

122. *Acanthis hornemannii exilipes*. HOARY REDPOLL.—Rare. A Hoary Redpoll was observed by me at my ranch in Dawson County on March 9, 1905.¹ It was very tame, and in a flock of common Redpolls would have looked like a white bird.

Dr. Louis B. Bishop has a note in the Auk (Vol. XVIII, p. 195) of two Hoary Redpolls collected by Mr. C. F. Hedges, at Miles City, on February 26 and March 12, 1900.

¹ See Auk, Vol. XXII, p. 313.

123. *Acanthis linaria*. REDPOLL.—Common. An erratic winter migrant in both counties. Sometimes appearing in hundreds. Roving flocks of Redpolls may be seen at all times and in all places from October until the end of April. I saw numbers of Redpolls in the town of Miles City January 3, 1905, when the temperature was twenty below zero. In November, any flock of small birds, seen flying, will almost certainly be Redpolls. During the whole of this month, restless flocks flit through the pine hills, alighting on the ground to feed on sage-brush, and the ubiquitous weed which, a month earlier, is sought eagerly by Tree Sparrows. While thus scattered over the hillsides, a large flock seems to contain only about twenty birds, as so few are in sight, and these are perched on the sage tops, or on the withered heads of the aforesaid pink daisies. If the birds become alarmed, they fly to the skeleton branch of some dead cedar, when the reunited flock is shown to be ten times the number supposed. I have noticed that in these flocks the adult males, with carmine breasts, are in proportion of about six per cent. to the females and young of the year.

In midwinter, when deep snow covers the ground, large flocks of Redpolls may be seen on the prairie, eking out a scanty subsistence from sage-brush. Six or more birds, clinging to a single shoot as they endeavor to detach what few seeds still adhere, make a pretty sight.

On March 2, 1904, I was driving up cattle during a blizzard. The nearest heifer stepped on a sage-bush, when out fluttered a solitary male Redpoll, in splendid plumage, and attempted to alight on her hock. The heifer kicked at, and narrowly missed the bird, which seemed so dazed that it might, apparently, have been caught by hand. I have seen Redpolls chasing each other as though they were pairing, on March 22. At this time the males sing first after sunrise, or between six and seven.

124. *Acanthis linaria holboëllii*. HOLBÖELL'S REDPOLL.—Rare. Two skins of this subspecies were obtained by Mr. C. F. Hedges at Miles City, March 2, 1900. (See Louis B. Bishop, Auk, XVIII, p. 195.)

125. *Acanthis linaria rostrata*. GREATER REDPOLL.—Rare. Three specimens of this bird were obtained by Mr. C. F. Hedges at Miles City on March 1 and 6, 1900 (recorded in 'The Auk,' by Dr. Louis B. Bishop, as above).

126. *Astragalinus tristis*. AMERICAN GOLDFINCH.—Common summer visitor in both counties. Nests indifferently in pine hills and river valleys. At least two pairs of Goldfinches nested annually on my ranch near Terry, Custer County, and flocks came to my water-troughs in Dawson County.

127. *Astragalinus tristis pallidus*. WESTERN GOLDFINCH.—This subspecies is included by Dr. Mearns in his 'Birds of Fort Custer,' which was formerly in Custer County. (Condor, Vol. VI, No. 1, p. 21.)

128. *Spinus pinus*. PINE SISKIN.—Rare. Six came regularly to my water-troughs in Dawson County during July, 1906. Two were seen near Knowlton May 30, 1907.

129. *Passer domesticus*. ENGLISH SPARROW.—Tolerably common.

I first observed English Sparrows here on December 6, 1899, at Terry. These birds are now common in towns along the Northern Pacific Railroad, and are visitors to different ranches. Numbers frequented, and bred, upon the ranches of Messrs. Archdale and Price, near Knowlton, but all subsequently departed.

130. *Plectrophenax nivalis*. SNOWFLAKE.—Abundant. An erratic, but regular winter visitor in both counties. My records (from 1889) show that this species is most plentiful in February, may appear here as early as November 18, but is not seen after March 16. Snowflakes are more numerous in severe winters, and, associating with Horned Larks, form vast flocks numbering many hundred birds. They are fond of feeding on the haystacks at parts from which the hay has been fresh cut, and rye stacks possess a great attraction for them. In very cold weather their tameness is such that they may be caught with an ordinary stable fork, and during the first week of February, 1893, Mr. J. H. Price saw seven or eight Snowflakes which had been frozen to death. The birds show all shades of buff and gray, while some are black and white with buff heads. Snowflakes perch on corrals here, but I have never observed them to perch in trees, although this is a well known habit referred to by many ornithologists in different parts of the world.

131. *Calcarius lapponicus*. LAPLAND LONGSPUR.—Not common. An erratic winter migrant in very severe weather, associating with flocks of Snowflakes. On February 16, 1904, I kept under observation for two days twenty of these Longspurs, which consorted with several times this number of Snowflakes at my corrals in Dawson County. A flock of about fifty Redpolls nearby, did not mix with the other birds. Some of the adult male Longspurs had conspicuous chestnut on the back of the neck and blue throats, partly concealed by white feathers. Their plumage was altogether brighter than I had supposed from written descriptions. The Longspurs closely resembled the Snowflakes in their habits, and ran about swiftly inside the corrals or perched on the bars. Like the latter, they searched on the haystacks or manure heap, and, as with them, individual Longspurs became absolutely fearless, from the effects of cold and hunger.

132. *Calcarius ornatus*. CHESTNUT-COLLARED LONGSPUR.—Common summer resident in both counties; a typical prairie bird. Arrives in small companies early in May, but never, to my knowledge, in the large flocks characteristic of McCown's Longspur. It always associates with the latter bird, and I have found the nests of both species close together. Chestnut-collared Longspurs only frequent high tablelands, and are most numerous on the big flat about Terry (Custer County) between the Powder River and Fallon Creek, whose southern boundary is the pine hills around Knowlton. One of my pastures, at the commencement of this flat, was a favorite nesting site with them and *R. mccowni*. The birds are paired by the end of May, and set about making their nests of grass, lined with the same or cow hair, on the ground. These are invariably placed under a clump of wild oaks or tall weeds, and the sitting bird is below the surface

of the prairie. I have never seen more than three eggs or three nestlings, although Coues gives the number as four. Often, when riding over the plain, my horse almost stepped upon the sitting female which slipped, fluttering, from her nest into the depths of the surrounding grass. Here the bird would remain invisible but for her maternal anxiety which causes her to hover repeatedly on the wing, and if the horse is moved only a few yards, she at once settles down upon her eggs. The young are generally hatched out during the first week of July, when the parents of this species and the next (*R. mccowni*) run about in the herbage like mice. If the nest is actually discovered, they hover fearlessly above the intruder, and make impetuous dives into the grass. At this time, the females of both species share with Desert Horned Larks the habit of running long distances in the road-ruts directly in front of horses. The young are at first covered with buff-colored down, but when full-fledged (about the middle of July) become very dark gray, inclining to black, with white stripes on the wings. At pairing time, and during incubation, the males indulge in extraordinary tricks of flight, "singing as they fly, rising to a great height and letting themselves down with the wings held like parachutes; they curiously resemble butterflies when so engaged."¹

By the second week in September the males have lost their nuptial dress, and before the end of the month the birds associate in immense flocks with McCown's Longspurs and Horned Larks. Early in October they leave for the South.

133. *Rhynchophanes mccownii*. McCOWN'S LONGSPUR.—Summer resident; abundant in both counties. Arrives in immense flocks towards the end of April, and is seemingly a most punctual migrant, as my notes give April 26, 27, and 29, for 1897, '98, and '99 as the dates of first appearance. The birds, which scatter over the ground as they alight, hide in the horse and cattle hoof prints, or other holes, and allow themselves to be almost trodden upon before rising. A large flock was driven into the shelter of my ranch buildings, near Terry, during a terrific thunder storm on May 15, 1894. Stones were whirled about and struck against the ranch house, when the thoroughly soaked birds received such a buffeting that they were barely able to fly. McCown's Longspur is in all respects similar in habits to the previous bird (*C. ornatus*) excepting that in my experience the female *R. mccownii* lays four eggs instead of three. On June 22, 1894, I had ample opportunity for observing this species, as, my horse having run away, I was compelled to walk home, ten miles across the prairie. My way was enlivened by the handsome males, which hung above me, before sinking into the grass with a burst of song, in strong contrast to the dowdy, brown females which I frequently flushed from their nests. The eggs differ a good deal; the ground color may be green or white, and an egg may be entirely white, unmarked. Some of the young could fly feebly by July 10.

(To be concluded.)

¹ Key to North American Birds, by Elliott Coues, 1887, p. 359.

SUMMER BIRDS OF SOUTHWESTERN
SASKATCHEWAN.

BY A. C. BENT.

Plates XVII-XX.

THE development of the great Northwest, the extension of its progressive railroad systems, with new towns constantly springing up and all of the older towns and cities rapidly increasing in size, the steadily increasing movement of American, Canadian and foreign settlers westward and northward, and the inducements offered by the Canadian government and the railroads for opening up new and desirable lands for agricultural purposes, are making such rapid and marked changes in the great wild-fowl breeding grounds of northwest Canada, that it seems worth while to record the conditions as we found them during the summers of 1905 and 1906. Even during the one year intervening between my two visits to this region, the change was so striking as to indicate the passing away within the near future of nearly all of the great breeding resorts of this interesting region. Many of the rarer, shyer and larger birds have already disappeared and the others are being rapidly driven farther northward and westward, beyond the reach of railroads and beyond the cultivated lands of the ranchmen. The disappearance of the birds is not due to persecution, as they are seldom killed, and their eggs are not often taken for food, but the prairies are being cultivated, the sloughs are being drained and the whole country is being settled up so rapidly that they will soon have no suitable breeding grounds left.

Our observations were conducted mainly along the line of the Canadian Pacific Railway from a few miles west of the eastern boundary of Alberta to about fifty miles east of said boundary in that portion of Saskatchewan which was known as Assiniboia prior to 1906; and we explored, more or less thoroughly, much of the intervening territory, including the Cypress Hills, twenty miles south of the railroad and Big Stick Lake, thirty miles north of the railroad. We visited nearly all of the lakes from Many Island

Lake on the west to Lake of the Narrows on the east and explored most of the intervening creeks running northward into these lakes from the Cypress Hills region, particularly Maple Creek, Skull Creek, Mackaye Creek and Bear Creek.

In 1906 our party consisted of Rev. Herbert K. Job, of Kent, Conn., Mr. Chester S. Day of Boston, Mass., and the writer. I arrived on May 29 and left on June 17. The others arrived a few days earlier and Mr. Job remained a week after I had left.

In 1906 Dr. Louis B. Bishop of New Haven, Conn., and I reached Maple Creek on June 5; I was obliged to leave for home on July 1, but he remained until August. Mr. Alfred Eastgate of North Dakota joined us two weeks later, as taxidermist and general assistant. And Dr. Jonathan Dwight, Jr., of New York, joined the party after I left. Thus we were able to observe the last week of the spring migration in 1905 and a large part of the adult shore bird fall migration in 1906. I am indebted to all of these gentlemen for the use of their notes and particularly to Dr. Bishop for much valuable assistance in the comparison of material and the determination of subspecies. I also wish to acknowledge the kind assistance of Mr. William Brewster and Mr. H. C. Oberholser in identifying material. Specimens were collected of nearly all the birds on the list and where none were taken this fact is mentioned. Birds seen by others than the writer are entered on the authority of the observer. The only published list of the birds of this region that I have seen is contained in Prof. John Macoun's 'Catalogue of Canadian Birds,' to which I shall make occasional reference and endeavor to point out a few cases where our observations were at variance with this list. I am indebted to Prof. Macoun also for much valuable information regarding this region and for assistance in obtaining permits to collect.

The general topography of the region under consideration was rather uninteresting; the first impression of it was disappointing and it was not until we had made a more intimate acquaintance with its more highly favored sections that we began to realize its wonderful possibilities as a collecting ground. The contrast between the level, fertile prairies of western Manitoba and the desolate rolling plains of Saskatchewan was well marked. These plains were nowhere extensively level and were often quite hilly.



FIG. 1. ON THE PLAINS NORTH OF MAPLE CREEK.



FIG. 2. CYPRESS HILLS.

They exhibited three distinct types of soil, supporting three different kinds of vegetation and were more or less distinct faunally. For convenience I shall designate them as the prairies, the sandhills and the alkaline plains.

The prairies were practically devoid of all vegetation except a sparse, short growth of grass, which grew most sparingly on the hills and more luxuriantly in the hollows. A few scattered small rose bushes, stunted bits of sage-brush and two species of low-growing cacti, occasionally met with, were all that we found to relieve the monotony. The soil was hardly rich enough for cultivation, though wheat and flax were being successfully raised in many places with the aid of a little fertilizing; but for grazing purposes these portions of the plains, which comprised by far the greater part of the whole region, were well adapted and large scattered herds of horses, cattle and sheep roamed at will over vast areas. Thirty years ago the last of the buffalos disappeared, but their trails were still visible in many places — narrow, deeply worn pathways where countless herds had passed along in single file. Many of their wallows were also recognizable, but their bones had long since been picked up and sold; only an occasional skull or horn was to be found. Antelopes had been frequently seen in recent years but they were fast disappearing. Prairie wolves were not yet rare and we obtained several shots at them, at long range, but succeeded in killing only one. Badgers were fairly common and gophers were only too numerous. Birds were scarce on the prairies or so widely scattered that they appeared so. Long-billed Curlews and Bartramian Sandpipers found congenial homes in the grassy hollows; gulls were occasionally seen, particularly near the lakes; hawks were frequently seen sailing overhead or perched on fence posts or telegraph poles along the railroad, and if one had sharp ears he could often hear the flight song of Sprague's Pipit or more rarely see one soaring way up in the sky, a mere speck against the clouds. But the characteristic birds of the prairies were the Longspurs, Lark Buntings, Vesper Sparrows and Meadowlarks, and their delightful songs added much charm to a drive across the grassy plains.

Among the sandhills, though the soil was poorer and the ground often bare and sandy, there was sufficient nourishment to support

a considerable growth of underbrush, extensive patches of rose bushes, sage-brush and various willows, forming in some places dense thickets of the large willows, growing eight or ten feet high, with a few scattered poplar trees among them. The sandhills were the favorite resorts of the Prairie Sharp-tailed Grouse where they found congenial shelter among the willows and convenient dusting places in the sandy hollows. Nearly every available solitary tree — poplars, cottonwoods and willows — in such places was occupied by a hawk's, owl's or crow's nest, seldom more than 15 feet from the ground. The underbrush offered a congenial home for Clay-colored Sparrows where we found a number of nests in the small 'silver willows' and 'badger brush', close to the ground.

I designate as alkaline plains certain flat, level areas, sometimes two or three miles wide, which were probably once the beds of alkaline lakes, where the soil was strongly alkaline, forming slimy mud in wet weather, or baked hard and dry under the hot summer sun. Very little grass would grow in such places but the plains were well covered with a stunted growth of sage-brush and cactus. An occasional Burrowing Owl could be seen on the plains, but the characteristic birds of the region were Horned Larks, Vesper Sparrows and a few Lark Buntings, none of which were abundant. With this brief description of the three classes of plains, which in the aggregate comprised fully 95 per cent. of the whole region, we will leave this comparatively uninteresting phase of the subject and consider some of the more highly favored localities which we found much richer in bird life and therefore of much greater interest ornithologically.

The timber belts along the streams, or 'creeks' as they were called, proved to be the most fruitful collecting grounds and were fairly teeming with small birds of many species. Many of the creeks were practically treeless or nearly devoid of underbrush for long distances, but a large portion of Skull Creek and nearly the whole upper half of Maple Creek were more or less heavily timbered. The largest trees, poplars, balsms, cottonwoods, willows and box elders were generally well scattered along the banks of the streams, sometimes towering above the surrounding small trees and underbrush to a height of 30 or 40 feet but more often not exceeding 20 or 30 feet. Scattered groves of box elders 15 or

20 feet high often occupied flood plain areas from 50 to 100 yards wide; and, as they were frequently irrigated at periods of high water, they often supported a rank growth of underbrush which in some places had developed into dense thickets of willows, thorns, and other high growing shrubs. Most of the timber was of this class, an open growth of the larger trees, with thick patches of underbrush and occasional dense thickets among them. We occasionally found, however, dense shady groves of small poplars, balsms or quaking aspens, about 15 or 20 feet high, entirely devoid of underbrush, occupying limited areas in well watered bottom lands. The streams were all small, meandering sluggishly through devious courses which had been deeply cut below the level of the plains, leaving frequently high 'cut-banks'; they were generally shallow enough to wade and often narrow enough to jump across. During periods of heavy rain the streams soon became very much swollen; during the first week in June, 1906, we were favored with an unusually heavy rain fall which caused a rise of fully 10 feet in Maple Creek, submerging much of the timber and flooding the surrounding plains.

The largest trees contained the nests of Ferruginous Rough-legs or Swainson's Hawks which were often visible for long distances, as they stood out plainly above the surrounding timber. Hunting for hawk's nests was therefore a simple matter as it was merely necessary to drive along on the high land and examine the large trees with a glass. The available nesting sites for hawks were so limited that we found their nests quite numerous in all suitable timber; ten occupied nests were examined in a single day's drive of about twelve miles. The deserted nests of the larger hawks were sometimes occupied by Horned or Long-eared Owls. The box elder groves made satisfactory homes for the Sparrow Hawks, where we found them nesting in natural cavities or in deserted Flicker holes. Birds were more abundant in the open box elder groves than elsewhere in the timber, among which the Western House Wrens were decidedly the most numerous and most constantly in evidence; the woods were full of their delightful little bubbling songs and every small cavity in the dead branches or weather worn trunks of the box elders would sooner or later contain one of their nests. Hybrid Flickers of various colors were

common and excavated their nest holes in any of the larger trees. Nighthawks were frequently seen flying overhead or perched lengthwise on the horizontal branches. Brewer's Blackbirds were exceedingly numerous and noisy, protesting vigorously at our intrusion but their nests were usually too well concealed in the low thick underbrush for us to find them. Arkansas and common Kingbirds were much in evidence and clamorous, as usual, both species being about equally abundant. Clay-colored Sparrows were abundant in the underbrush, particularly along the outer edges, where Yellow-throats and Yellow Warblers were also very common. Robins, Catbirds, Song Sparrows and Least Flycatchers were all fairly common, an occasional Arctic Towhee was seen and the voice of the Willow Thrush was frequently heard in the depths of the shady thickets near the stream, though the birds themselves were seldom seen. Many other less prominent species were noted, as well as a number of rarities which will be found in the list, but the foregoing will give a fair idea of the characteristic birds most frequently seen.

From 15 to 20 miles south of the railroad lay the Cypress Hills, extending for approximately 50 miles east and west, nearly parallel with the railroad and visible at a long distance, their irregular outline forming the southern boundary of our view, like a distant chain of mountains. They were, however, rather low-lying hills, probably not over 300 or 400 feet above the general level of the plains. All of the creeks that we explored had their sources in these hills and flowed in a general northerly direction to the lakes, Mackaye Creek running into Many Island Lake, Hay Creek into Hay Lake, Maple Creek into Big Stick Lake, Piapot and Bear Creeks into Crane Lake, and Skull Creek into Lake of the Narrows. We were unable to explore more than a limited portion of the Cypress Hills but found them full of interesting material and well worthy of more extended investigation. The approaches to the hills and the outlying spurs, or what might be called the foothills, were merely continuations of the prairies, but the higher portions were extensively wooded with a low growth of poplars, balsams, aspens, willows and various shrubs. The interior valleys contained several small lakes or ponds and were watered by small creeks or brooks, supporting dense thickets of alders and willows.

The hills in the interior were largely covered with fair sized pines and spruces; we were told that large tracts of heavy coniferous timber existed here; several piles of large logs that we saw and the log cabins of some of the settlers bore testimony to the truth of this report. Many of the birds seen in the Cypress Hills were common to the whole region but the following species were noted here which were not seen elsewhere: Western Wood Pewee, Alder and Wright's Flycatchers, American Crossbill, White-crowned Sparrow, Pink-sided Junco, Orange-crowned, Audubon's and Macgillivray's Warblers and Alma's Thrush.

The most striking features of the whole region, the real ornithological wonders of the great Northwest, were the breeding grounds of the water-fowl. In my attempt to give some adequate idea of these marvelous wild-fowl nurseries I cannot do better than endeavor to describe two or three typical sloughs and islands that we visited, though I realize that my words cannot but fail to convey the impressions I received, for such things must be seen in order to be appreciated.

Many Island Lake was in reality a many island marsh, irregular in outline and approximately 6 miles in diameter, consisting of a series of wet meadows, low grassy islands, deep sloughs full of bulrushes or cattail flags, shallow sloughs overgrown with long grass and open pond like areas. We could drive from one island to another by crossing the shallower sloughs at favorable spots, but often narrowly escaped being badly mired. The islands were so nearly indistinguishable from the marshes that we could form no idea as to their number or extent. Some of the more clearly defined islands in the more open portions of the lake formed suitable breeding grounds for California and Ring-billed Gulls, Common Terns and Avocets where they could make their nests on the higher portions or along the shores on dry ground. Killdeers, Spotted Sandpipers and Willets were evidently breeding on some of the islands; Wilson's Phalaropes were abundant, we found their nests on the grassy islands and saw large flocks of females flying about over the marshes; a number of Yellow-legs were associated with them and possibly some of them were breeding here. A cloud of Franklin's Gulls were hovering over an extensive deep-water slough where we found them established in a large breeding

colony. In the same slough Western and American Eared Grebes were breeding as well as numerous Coots, Bitterns, Canvasbacks, Redheads, Ruddy Ducks and Yellow-headed Blackbirds, but collecting in these sloughs was impracticable as the water was too deep to wade even with our longest waders. All of the commoner ducks were exceedingly numerous, such as Mallards, Pintails, Gadwalls, Baldpates, Shovellers and Blue-winged Teals, and were nesting on the grassy islands and in the meadows. A few Forster's Terns were seen, and Marsh Hawks and Short-eared Owls were flying about over the meadows. The whole region was fairly swarming with water birds and to merely mention the species we recorded gives but a very meager idea of their actual abundance. It is to be hoped that this locality, so well adapted for their requirements, will remain for a long time undisturbed. It is poorly adapted for agricultural purposes and is ten miles distant from the nearest settlement. There are no suitable camping sites near it, as firewood and good drinking water are not easily available, and the myriads of mosquitos which infest this locality make the collector's life miserable. If it could be set aside as a government reservation and the birds could be protected, it would prove a safe asylum for many years.

While exploring a long, narrow strip of gravelly beach which extended well out into the waters of Big Stick Lake, on which numerous Piping Plovers and Common Terns were nesting, we noticed a small island, about 300 yards from the shore, over which a cloud of gulls were hovering. Numerous Avocets were flying back and forth between the island and the beach, a flock of Pelicans flew off and settled on the island, various ducks were swimming in the lake near it, and everything seemed to indicate that we should find it well worth visiting. The next day, June 14, 1906, our guide hitched up a pair of horses and drove us out to it, through the shallow water, landing us on a narrow point of beach. It was a low, flat island, surrounded by gravelly or muddy beaches, largely bare on the higher portions, except for a scattered growth of coarse dead weeds, but supporting quite a thick growth of long grass on the lower or flatter portion. It may have contained more than one acre of land but certainly not over two acres at the most. As we landed a flock of American White Pelicans flew off from

the farther end and a great cloud of California and Ring-billed Gulls arose from the center of the island, but we devoted our attention at first to the American Avocets which had flown out to greet us with their yelping notes of protest. Their nests were placed in the short grass near the beach or on the windrows of driftweed which lined the shores. There were not over a dozen pairs in the colony. A small colony of Common Terns were nesting in the short grass, two nests of Spotted Sandpipers were found, Wilson's Phalaropes were flying about, and specimens of Northern Phalaropes and Semipalmated Sandpipers were collected. In the long grass we found a Pintail's nest with nine eggs in the process of hatching and five ducks' nests, with apparently fresh eggs, which we took to be Baldpates, though we could not identify them with certainty, as the birds were not incubating. On the higher portion of the island, among the tall dead weeds, we found three ducks' nests, referred to hereafter under the American Merganser, which we were unable to satisfactorily identify. The California and Ring-billed Gull colony occupied the whole of the main portion of the island, which was thickly covered with their nests; we could form no accurate idea of their numbers, as we did not have time to count the nests, but to say that there were at least 1000 pairs of each species would be a conservative statement. The nests of the Ring-billed Gulls were chiefly on the higher portion of the island, while those of the California Gulls were mostly around the shores and on a bare, flat point, though both species were somewhat intermingled where the two colonies came together. I should say that about half of the eggs had hatched, for we found hundreds of the downy young hiding among the scanty vegetation and saw them swimming out from the shores in large numbers. This island was visited again, by the other members of our party, on July 18-21, 1906, when they found the bird population of the little island increased by a nesting colony of fourteen pairs of American White Pelicans and four pairs of Double-crested Cormorants. On the neighboring shores of the lake and on the adjacent meadows and prairies the shore birds were well represented by numerous Long-billed Curlews, Western Willets, Marbled Godwits and Killdeers, all of which were breeding in the immediate vicinity.

The most interesting locality of all was the duck island in Crane

Lake and its surrounding sloughs at the mouth of Bear Creek, where the water-fowl were breeding in such great profusion and in such a limited area, less than one square mile, as to make it the crowning glory of the whole region. We spent considerable time here both seasons and recorded in all 35 species of birds, mostly water-fowl and shore-birds, that were either breeding or probably preparing to breed within this limited area. On the prairies and meadows near the lake we found scattered nests of various ducks, where Long-billed Curlews, Western Willets and Marbled Godwits were also breeding. On the shores of the lake and the island American Avocets, Killdeers and Spotted Sandpipers were nesting. The extensive deep-water sloughs, surrounding the island, which were filled with scattered clumps of tall bulrushes, concealed the nests of hundreds of Western Grebes, American Coots and American Bitterns. A fair sized colony of Franklin's Gulls was found and a number of nests of Horned and American Eared Grebes. Large flocks of Canvasbacks and Redheads were constantly floating in the lake or flying over us, though we succeeded in finding only a few nests of each. Small flocks of Ruddy Ducks frequently darted past us and we saw the gaudy little males swimming among the reeds. Thousands of Yellow-headed Blackbirds kept up a constant din all through the sloughs and Red-winged Blackbirds were nesting about the edges, where a few Soras were also seen.

The island was about 300 or 400 yards in length by about 100 yards in width, fairly high at one end and everywhere covered with a thick growth of long grass, through which were scattered on the higher portion numerous small clumps and in some places large patches of rose bushes, offering ideal conditions as a breeding ground for ducks. There were several small ponds near the center of it lined with fringes of cattails and bulrushes. On the lower portion of the island the grass was shorter, and where it extended out into a point the ground was bare. A colony of Common Terns occupied this point, which was also the favorite resort of a flock of White Pelicans which may have bred here later in the season. Marbled Godwits, Wilson's Phalaropes and Spotted Sandpipers were breeding here as well as Western Savanna Sparrows. A pair of Crows had a nest in the only tree on the island, a small

willow, and they must have fared sumptuously on stolen duck's eggs. A pair of Short-eared Owls had a nest on the island containing young in various stages of growth. On June 17, 1905, Mr. Job and I attempted to make a careful census of the ducks breeding on the island, by dragging it as thoroughly as we could with a long rope and recording the nests as the ducks were flushed. We were unable to drag the whole island as the rose bushes were too thick in many places, but in the course of two hours' work we recorded 61 nests, as follows: Mallard, 5 nests; Gadwall, 23 nests; Baldpate, 3 nests; Green-winged Teal, 2 nests; Blue-winged Teal, 10 nests; Shoveller, 7 nests; Pintail, 8 nests; and Lesser Scaup Duck, 3 nests. The ducks were identified to the best of our ability by eyesight; the female Gadwalls and Baldpates were very difficult to distinguish and there may have been more of the latter than we supposed, but certainly both species were nesting there, as we saw a number of males in the small pond-holes; the Green-winged 'Teals' nests were identified by seeing the female join a male of that species. We started a number of ducks, mostly Pintails, where we failed to find nests, which probably meant broods of young and which were not counted. Most of the sets were incomplete or fresh indicating that the ducks were only just beginning to lay; we therefore must have overlooked a great many nests, where the eggs were covered and no ducks flushed, as we found a number of such nests by accident. Considering these facts, making allowance for the unexplored parts of the island and judging from the immense numbers of ducks that were flying about or bedded out on the lake, I considered it fair to assume that at least 150 pairs of ducks were breeding or preparing to breed on this one island. In addition to the species above recorded, we saw on the island several American Mergansers, a White-winged Scoter and one Cinnamon Teal, making a total of 14 species of ducks which were probably breeding on the island or in the sloughs around it, of which we actually found the nests of 11 species. Prof. Macoun recorded the American Scaup Duck as breeding here, but we were unable to identify any with certainty; I found a nest in the slough near this island which I feel fairly confident was a Ring-necked Duck's nest, but I was unable to shoot the bird; these two species must therefore be considered of doubtful occurrence, at present. As may be imagined, it was with considerable interest and pleasant

anticipation that I revisited this island in 1906, but I was most keenly disappointed to find it practically deserted. Instead of the immense flocks of ducks which I had seen rise from the sloughs like clouds of mosquitos, only a few scattered flocks were seen. As we walked across the island expecting to see ducks flying up all about us, hardly a duck arose, and in place of the 60 odd nests that we expected to find only 3 nests were found. The mystery was soon solved by finding a nestful of broken eggs and bunches of yellowish hair clinging to the rose bushes. A coyote had been living on the island and had cleaned out all of the nests and driven the ducks away. The destruction of the bird population of the island had been still further carried on by a family of minks and the entrance to their den was strewn with feathers. Whether the ducks will ever return to this island or not is an open question, but probably they have moved to some safer spot.

Such were the conditions as we found them in the localities we visited and I have no reason to think that they were exceptional. I have no doubt that similar conditions still prevail throughout nearly all of the unsettled portions of the northwestern plains. We passed in the train many similar localities, which looked equally attractive, where birds were apparently equally abundant, and, had we selected some other section and worked it up as thoroughly, I have no doubt that the results would have been similar. But there can be no doubt that these conditions are rapidly passing away, and unless something can be accomplished towards setting apart some extensive reservations where the birds can breed in safety and be protected against the encroachments of civilization, the glories of this region will soon become mere memories of the past.

In the following list of species I have endeavored to follow, as far as possible, the nomenclature, as it now stands, in the present A. O. U. Check-List without attempting to adopt even such changes as are definitely decided upon. I realize that the list is far from complete, owing to the limited time devoted to field work, but it seems worth while to publish it as a basis for further work and as a contribution to our knowledge of the birds of an interesting region. I trust it will serve to throw some light on the distribution of certain western species and subspecies and help to define their breeding ranges more accurately.



FIG. 1. NESTS OF WESTERN GREBE.



FIG. 2. SLOUGH AT REEDY LAKE. NESTING SITE OF WESTERN GREBE.

1. *Aechmophorus occidentalis*. WESTERN GREBE.—Abundant in all of the deep water sloughs where its nests were floating in water from two to three feet deep, among the bulrushes. There was a very large breeding colony at Crane Lake in 1905, which had nearly doubled in size in 1906, so that it must have contained several hundred pairs. Eggs were found at various dates between June 8 and 26, and young birds were seen on June 8, 1905, but very few of the eggs were hatched before the end of June. We noticed a great mortality among these birds in 1905, finding their dead bodies floating near their nests or lying on them, sometimes two birds at one nest. We were unable to account for this unless it was done by muskrats, which were common in the sloughs. Most of the nests contained 3 eggs, some 2, some 4, and one the unusual number of 11; this last was apparently the work of several birds.

2. *Colymbus holboëllii*. HOLBØELL'S GREBE.—This species was recorded by Prof. Macoun at Indian Head, Assa., and at Snake Lake, Alberta. I saw a grebe at Crane Lake on June 7, 1905, which I took to be Holboëll's, but none were collected either season and no others were seen, so I consider my record very doubtful.

3. *Colymbus auritus*. HORNE GREBE.—Uncommon in 1905, rare in 1906. A few pairs were found breeding in the Crane Lake sloughs and, as they were quite tame, were easily identified, though none were taken. Nests were found on June 7, 1905, and on June 22, 1906, in the Western Grebe colony, containing from 5 to 9 eggs.

4. *Colymbus nigricollis californicus*. AMERICAN EARED GREBE.—Common. Breeding in all of the sloughs and laying usually 4 or 5 eggs. They were found breeding quite abundantly in a large breeding colony of Franklin's Gulls, at Lake of the Narrows, on June 10 and 12, 1905, at which time all of the eggs collected were fresh. Nests were also found on June 22, 23 and 26, 1906.

5. *Larus californicus*. CALIFORNIA GULL.—Common, on or about all of the larger lakes and about the garbage piles near the towns. A large breeding colony of this and the following species was found on an island in Big Stick Lake, on June 14, 1906, at which time about half of the eggs had hatched.

Prof. Macoun recorded the Herring Gull as breeding at Crane Lake, but we did not meet with it at all and I am confident that the birds he saw should be referred to this species. We collected quite a series of large gulls and all of them were either *californicus* or *delawarensis*.

6. *Larus delawarensis*. RING-BILLED GULL.—Common. Seen regularly at all of the lakes we visited. The only breeding colony found was the one referred to under the foregoing species.

7. *Larus franklinii*. FRANKLIN'S GULL.—Abundant about all the lakes and sloughs. Small flocks of Franklin's Gulls were frequently seen, towards evening, skimming low over the meadows after the manner of swallows and apparently catching insects on the wing. An immense breeding colony of these gulls was found at Lake of the Narrows on June

9, 1905, where they were nesting in a large shallow bulrush slough. They occupied an area approximately 1000 yards long by 100 yards wide and by counting the nests in an area 10 yards square, I estimated that there were from 15,000 to 20,000 nests in the colony. Many of the eggs that we collected were heavily incubated and some of them were hatching at that time. We visited this colony in 1906 but were disappointed to find it entirely deserted, probably owing to the fact that the slough had been nearly dry earlier in the season when they were beginning to breed. We found three other, smaller, breeding colonies in 1906 at Crane Lake, Reedy Lake and Many Island Lake, finding eggs as late as June 26.

8. *Sterna forsteri*. FORSTER'S TERN.—Rare. A few birds were seen at Many Island Lake on June 18, 1906, and on July 9 two specimens were taken here by Dr. Bishop. This species is not recorded by Prof. Macoun farther west than Indian Head.

9. *Sterna hirundo*. COMMON TERN.—Common but nowhere very abundant. Found breeding at all of the larger lakes, principally on the islands. Eggs were found on June 1 and 7, 1905, on June 13, 14 and 15 and on July 9, 1906.

Scattering birds were frequently seen near the creeks at long distances from the lakes.

10. *Hydrochelidon nigra surinamensis*. BLACK TERN.—Common in certain localities, particularly shallow sweet water sloughs or wet meadows, over which a number of these terns were generally to be seen hovering. It was only in these shallow grassy sloughs that we found them breeding where their eggs were laid on floating masses of dead vegetation. They are late breeders. We did not find their eggs until June 24, 1906, when several fresh sets were collected.

11. *Phalacrocorax dilophus*. DOUBLE-CRESTED CORMORANT.—Although this species is recorded by Prof. Macoun as breeding at Crane Lake, I did not see it at all either season. But Dr. Bishop reports finding four nests, with from 1 to 3 eggs each, on the island in Big Stick Lake, on July 21, 1906. I visited this island on June 14 and 15, 1906, but no cormorants were seen. No specimens were taken but they were undoubtedly of this species.

12. *Pelecanus erythrorhynchos*. AMERICAN WHITE PELICAN.—Common. Flocks of pelicans were seen almost daily at Crane Lake and at Big Stick Lake, frequenting the islands, but I was unable to find them breeding. The others were more fortunate for on July 18 and 21, 1906, they found 14 nests on the island in Big Stick Lake, 4 with 1 egg and 10 with 2 eggs each. Either these birds are late breeders or their first nests had been destroyed. A large flock of pelicans containing at least 150 birds was seen at Many Island Lake on July 13, 1906.

13. *Merganser americanus*. AMERICAN MERGANSER.—Uncommon. One or two birds were seen by Mr. Job at Crane Lake on June 15, 1905, and we saw a flock of 11 birds here on June 23, 1906.

On the island in Big Stick Lake on June 14, 1906, we found 3 ducks'

nests which we were unable to identify, containing 4, 8 and 9 eggs respectively. The eggs greatly resembled Redheads' and the nests were profusely lined with white down, but, as the nests were built on dry ground, partially concealed among coarse dead weeds, they may have belonged to this species. No mergansers were seen in the vicinity whereas several Redheads were seen on the lake. According to my experience the Redhead always builds its nest in water in a slough, but this may have been a departure from its usual custom. I regret exceedingly that none of the eggs were collected. No birds of this species were taken.

14. *Lophodytes cucullatus*. HOODED MERGANSER.—Two young birds, identified by Mr. Eastgate as this species, were seen but not taken on the timbered portion of Maple Creek on June 30, 1906. This region is not well suited for their requirements and they were probably merely stragglers.

15. *Anas boschas*. MALLARD.—Uncommon, but frequently seen in pairs or singly at various lakes and on nearly all of the creeks. The only nests found, 7 in all, were on the island in Crane Lake, 5 nests on June 17, 1905, and one each on June 13, 1905, and June 23, 1906.

16. *Chaulelasmus streperus*. GADWALL.—Abundant everywhere, the commonest of the ducks. We found in all 29 nests from June 10 to 17 in 1905 and on June 18 and 23 in 1906. Most of these nests were on the islands in the lakes, but some of them were on the meadows or prairies which we found by flushing the birds as we drove along. Downy young were taken on August 3, 1906.

17. *Mareca americana*. BALDPATE. Uncommon, but possibly commoner than we supposed, as it is difficult to distinguish, the female particularly, from the Gadwall. Frequently seen singly or in pairs on the creeks or in small pond holes, as well as on the larger lakes.

No nests were positively identified, but I am confident that we found at least 6 or 8 nests of this species, for they were certainly breeding on the islands with the other ducks.

18. *Nettion carolinensis*. GREEN-WINGED TEAL.—Rare. This species was undoubtedly breeding on the island in Crane Lake with the other ducks, as we saw them swimming in pairs in the little pond holes, and Mr. Job feels sure that he identified 2 nests, as belonging to this species, which we found here on June 17, 1905. Dr. Bishop also found and identified 2 nests of this species, shooting the female in each case, one in a meadow near Hay Creek on July 3 and one at Many Island Lake, on July 9, 1906, on dry ground among the bushes on a small island.

19. *Querquedula discors*. BLUE-WINGED TEAL.—Abundant. Found breeding on the islands and on the meadows near the lakes, 16 nests in all, between June 13 and July 9. One or more pairs of Blue-winged Teals were flushed from almost every little pond hole. Downy young were found on August 2, 1906.

20. *Querquedula cyanoptera*. CINNAMON TEAL.—Very rare or accidental. I saw and think I positively identified a male of this species on Hay Creek on June 1, 1905, and another at Crane Lake on June 17, 1905,

though my failure to collect either specimen renders the record doubtful. None were seen in 1906.

21. *Spatula clypeata*. SHOVELLER.— Abundant. This and the Blue-winged Teal rank next to the Gadwall in abundance. We found Shovellers breeding on all of the islands, on the meadows near the lakes and on the prairies at considerable distances from any water. Twelve nests were recorded at various dates all through the month of June. The birds were constantly in evidence on all the lakes and small pond holes.

Downy young were found on August 1, 1906, and eggs as late as July 9, 1906.

22. *Dafila acuta*. PINTAIL.— Common. Found breeding on the islands, on the meadows and on the prairies. One nest was found under a rose bush in the sand hills, one mile from the nearest creek and two miles from the nearest lake. Nests with eggs were found, 11 in all, from June 2 to 17, 1905, and broods of young were found on June 13, 1905, and on June 14 and 21, 1906. This duck is one of the earliest breeders. Pintails were more frequently seen on the larger lakes than elsewhere.

23. *Aythya americana*. REDHEAD.— Very common, about the larger lakes. Found breeding in all the sloughs. Nests were found on June 7, 1905, and on June 18, 1906. A few eggs of this species were generally to be found in all of the Canvasback's nests. These two species have a peculiar habit of building what we called dumping nests in which large numbers of eggs are deposited but apparently not incubated; we found two such nests, one of which contained 19 eggs, 9 of the Redhead and 10 of the Canvasback, piled up indiscriminately and some of them had rolled out of the nest which was partially broken down and evidently deserted.

24. *Aythya vallisneria*. CANVASBACK.— Very common. Large flocks of males were seen at Crane Lake and at Hay Lake, bedded away out from shore or flying about. We found them breeding in the Crane Lake sloughs. Nests were found on June 7, 1905, and on June 26, 1906. The nests were generally well concealed in the thick clumps of bulrushes and were hard to find. No birds were taken.

25. *Aythya marila*. SCAUP DUCK.— Of doubtful occurrence. This species was recorded by Prof. Macoun as breeding at Crane Lake, but, though we saw several that looked large enough to be of this species, none were collected or positively identified. No eggs were found which were referable to this species.

26. *Aythya affinis*. LESSER SCAUP DUCK.— Common. Found breeding at Crane and Hay Lakes; 6 nests were recorded, 3 on June 17, 1905, and one each on June 28 and 29 and July 3, 1906. These ducks were frequently seen swimming in pairs in the small pond holes and in the grassy, shallow places in the creeks, where they were quite tame. All of the Scaup Ducks that we collected were of this species. Downy young were found on August 2, 1906.

27. *Charitonetta albeola*. BUFFLE-HEAD.— Very rare or doubtful. A small duck was seen at Crane Lake in 1905 which was apparently a



FIG. 1. NEST OF CANADA GOOSE ON AN ISLAND IN CRANE LAKE.



FIG. 2. YOUNG LONG-BILLED CURLEW.

Buffle-head. The species was recorded by Prof. Macoun as breeding in Alberta and at Rush Lake, Saskatchewan.

28. *Oidemia deglandi*. WHITE-WINGED SCOTER.—Rare. Only three pairs were located. One nest was found, containing 9 fresh eggs, on June 28, 1906. It was well concealed under a thick clump of rose bushes near a small slough.

29. *Erismatura jamaicensis*. RUDDY DUCK.—Common in all the sloughs, where it breeds. It occasionally lays its eggs in the nests of other ducks, particularly the Canvasback and Redhead. We found a Western Grebe's nest containing 2 eggs of the grebe and one of the Ruddy Duck. I also flushed a female Ruddy Duck from a small clump of bulrushes which contained only grebe's nests and I think she was preparing to lay in one of them.

30. *Branta canadensis*. CANADA GOOSE.—Common on all of the larger lakes. Although it is an early breeder, 2 nests containing 6 eggs each were found at Crane Lake, on a small island, on June 2, 1905; these were undoubtedly second sets.

The geese were seen flying about in small flocks on June 2 and 8, 1905, and on June 9, 1906. No birds were taken.

31. *Olor columbianus*. WHISTLING SWAN.—One was seen at Crane Lake, on June 23, 1906, by Mr. Eastgate, probably this species. We were told that they were very abundant on the larger lakes on the migrations, particularly in the spring, but, so far as we could learn, they had not been known to breed here within recent years. We saw a fine specimen in a local taxidermist's shop.

We could learn nothing definite about the occurrence of the Trumpeter Swan in this region.

32. *Botaurus lentiginosus*. AMERICAN BITTERN.—Very common in all the sloughs, nesting abundantly in the thick bulrushes or cattail flags, where 5 nests were found in one day. It was also found nesting in the wet grassy meadows and once on a nearly dry meadow in short grass. Nests with eggs were found on June 7 and 13, 1905, and on June 22 and 24, 1906.

33. *Ardea herodias*. GREAT BLUE HERON.—A colony of about 20 pairs was found breeding in the Skull Creek timber on June 5, 1905. The nests were from 15 to 25 feet from the ground in the tops of the tallest box elder trees, sometimes 2 or 3 nests in one tree. Most of the nests contained small young or heavily incubated eggs, from 4 to 6 in number.

We visited this rookery again in 1906 but were disappointed to find it entirely deserted though showing signs of recent occupancy. A search through the grove revealed the evidences of a camp, probably made by Indians, about which were scattered the wings and feet of our herons. They had killed or driven away every bird and probably eaten the eggs or young. No birds were collected.

34. *Grus canadensis*. LITTLE BROWN CRANE.—A mounted specimen was seen in a taxidermist's shop in Maple Creek, said to have been taken in that vicinity.

35. *Grus mexicana*. SANDHILL CRANE.— Only one crane, probably this species, was seen from the train on May 28, 1905.

This is one of the species that has probably been driven farther north since the country became settled. Nothing could be learned of its occurrence here in the breeding season in recent years.

36. *Porzana carolina*. SORA.— Probably commoner than we supposed, but restricted to the shallow sloughs or wet meadows, where we spent very little time. We found a few pairs breeding in such places and saw nests with eggs on June 24, 1906.

37. *Fulica americana*. AMERICAN COOT.— Common in all the sloughs. A great many nests were found on various dates, as early as June 7, 1905, and as late as June 24, 1906. No birds were taken.

38. *Phalaropus lobatus*. NORTHERN PHALAROPE.— Abundant migrant. A few may breed. Seen migrating on May 29, 1905, in large flocks with Sanderlings. One was seen at Hay Lake on June 15, 1905. Two were taken at Big Stick Lake on June 14, 1906, which were in breeding condition.

Dr. Bishop saw a flock of 100 at Many Island Lake on July 13, 1906, which was the beginning of the fall migration. He found them still more abundant at Big Stick Lake on July 19, 1906. Nearly all of the birds taken on these two dates were females.

39. *Steganopus tricolor*. WILSON'S PHALAROPE.— Very common on the wet meadows about the lakes and sloughs and on the islands, where its nest is concealed in the short grass. Nests were found on June 8 and 17, 1905, June 18, 21 and 24, and July 13, 1906, with eggs. Downy young, recently hatched, were found on June 17, 1905. Large flocks of females were seen flying about at Many Island Lake on June 18, 1906, accompanied by a few Yellow-legs.

The almost complete reversal of the domestic relation of the sexes in this species is very interesting. The females are larger than the males and much more brilliantly colored. Two females were frequently seen chasing a single male and paying courtship to him. I observed a male building a nest in which the female did not seem to be interested and, so far as I could learn, the males performed all the duties of incubation and took charge of the young. As soon as the eggs were laid the females gathered into flocks and left the males to perform all the domestic duties.

40. *Recurvirostra americana*. AMERICAN AVOCET.— Abundant about all of the lakes and most of the small alkaline ponds. We found no large breeding colonies, but saw many small scattered colonies, the largest of which may have contained 15 or 20 pairs. The largest colony was on an alkali mud flat at Hay Lake where the nests were mere hollows in the mud, among the scattered tufts of short curly grass with which the flats were scantily covered. Owing to their protective coloration, the eggs were very difficult to see, even in such an open situation. A few isolated nests were also found along the shores of the lakes and on the islands, notably at Big Stick Lake. Four eggs was the usual number but two nests were

found containing five eggs each. Nests with eggs were found on June 15, 1905, and on June 14, 1906. Downy young were found on June 15, 1905, and June 29, 1906.

The Avocets were on the whole the most striking and conspicuous birds of this region; they were constantly in evidence and noisy, flying out to meet us as we approached their breeding grounds and protesting all the time with their shrill piping or yelping notes.

They fooled us frequently as to the location of their nests by squatting on the bare ground, as if sitting on their eggs, and then flying off yelping at us if we drew near. They were very much at home on the water, swimming lightly and gracefully, and feeding in the shallow water by dipping their heads under, like the surface feeding ducks. As soon as the young were able to run their parents led them to the water where they swam off easily and rapidly.

While conducting their courtships, in May, the Avocets were always amusing and often grotesque in their movements, as they danced along the shore or waded in the shallow water holding their wings fully extended, tipping from side to side, as if balancing themselves. Sometimes they would run rapidly along, crouching close to the ground, frequently nodding or bowing and sometimes they would lie flat on the water or ground, with wings outstretched as if in agony. At such times they were very tame, apparently oblivious of all else, and could be easily approached.

41. *Gallinago delicata*. WILSON'S SNIPE.—Very rare. Prof. Macoun found it breeding at the east end of the Cypress Hills on June 24, 1894, at which time the young were able to fly. Dr. Bishop saw one at Hay Creek on July 6, 1906. None were collected.

42. *Macrorhamphus scolopaceus*. LONG-BILLED DOWITCHER.—An uncommon migrant. A few were seen or collected by Dr. Bishop and Dr. Dwight, as follows: one at Hay Creek on July 3, 20 at Many Island Lake on July 13, one on July 18, 2 on July 21 and 1 July 22, 1906, at Big Stick Lake. All of these were adults, probably the beginning of the fall migration.

43. *Actodromas maculata*. PECTORAL SANDPIPER.—Dr. Bishop and Dr. Dwight found a few adults at Big Stick Lake on July 18, 21 and 22, 1906, securing several.

44. *Actodromas fuscicollis*. WHITE-RUMPED SANDPIPER.—Recorded by Prof. Macoun as seen as far west as Crane Lake and as probably breeding at Indian Head. We did not see any either season.

45. *Actodromas bairdii*. BAIRD'S SANDPIPER.—“We found a flock of about 50 at an alkali pond, 10 miles north of Maple Creek, on July 17, and about the same number there on July 21. At Big Stick Lake we found a few July 18 and 21. They were common on alkali ponds east of Maple Creek, August 1 and until we left. Young first seen on August 1.”—(Bishop.)

46. *Actodromas minutilla*. LEAST SANDPIPER.—“Spreadborough believes it breeds at Indian Head.” (Macoun.)

"I shot 2 young birds at Hay Creek on August 2. No others, certainly of this species, were noted, though they were probably seen several times." (Bishop.)

47. *Ereunetes pusillus*. SEMIPALMATED SANDPIPER.—Common migrant. Flocks of small migrating sandpipers, apparently of this species, were seen at Hay Lake, as early as May 29, 1905, and as late as June 9, 1906. An adult female that would soon have laid was collected at Big Stick Lake on June 14, 1906. Probably a few breed here.

The return migration was first noted by Dr. Bishop on July 17, 1906.

48. *Calidris arenaria*. SANDERLING. Abundant migrant. Large flocks were seen and specimens collected at Hay Lake on May 29, 1905. Dr. Bishop took an adult male from a flock there on June 9, 1906, and 2 adult males from a flock at Big Stick Lake on July 19, 1906.

49. *Limosa fedoa*. MARBLED GODWIT.—Very common about all the lakes, breeding in the short grass on the meadows. Four nests with eggs were found on May 29 and June 8, 1905, and on June 9 and 23, 1906. Two broods of downy young were found on June 27, 1906. We saw them gathering into flocks, as if preparing to migrate, on June 27, 1906. For a full account of this species, see 'The Auk' for April, 1907, Vol. XXIV, pp. 160-167.

50. *Limosa hæmastica*. HUDSONIAN GODWIT.—Probably occurs as a migrant.

"We saw a Godwit, with a white rump, feeding with a large flock of Marbled Godwits at Big Stick Lake on July 21 and 22, but could not secure it." (Bishop.)

51. *Totanus melanoleucus*. GREATER YELLOW-LEGS.—Possibly a few may breed here. We saw a few at Crane Lake on June 22, 23 and 26, 1906. Dr. Bishop shot a young female at Hay Creek on August 2, 1906.

52. *Totanus flavipes*. YELLOW-LEGS.—Probably a few breed here. Dr. Bishop saw one at Big Stick Lake on June 14, 1906, acting as if it had a nest.

A few were seen and one was shot out of a large flock of Wilson's Phalaropes at Many Island Lake, June 18, 1906. Birds were taken, probably migrants, during July and up to August 4, 1906, when our party left for home.

53. *Helodromas solitarius*. SOLITARY SANDPIPER.—"Tolerably common migrant. Adults first seen at Hay Creek on July 6. Young first seen at Maple Creek on July 30." (Bishop.) Specimens were taken on these dates.

54. *Helodromas solitarius cinnamomeus*. WESTERN SOLITARY SANDPIPER.—"Tolerably common migrant. Adults first seen at Maple Creek on June 30. Young first seen at Maple Creek on July 30." (Bishop.) Specimens were taken on these dates.

55. *Symphemia semipalmata inornata*. WESTERN WILLET.—Very common about all the lakes; one of the most conspicuous and noisy of the shore birds. It was breeding on the high, dry prairies, often a long dis-

tance from water, but owing to its habit of flying a long distance to meet the intruder and making a great fuss everywhere but near its nest, we succeeded in finding only one nest. This was in plain sight in short grass on a prairie hill and on June 14, 1906; it contained 3 fresh eggs. Downy young were taken on July 6 and 13, 1906. In addition to quite a variety of loud calls and alarm notes, it has an interesting flight song; particularly towards evening, we often saw one of these birds, flying in large circles high in the air, pouring out a rapid stream of whistling notes, sounding like *pill-will-willet*, repeated over and over again for a period of several minutes.

56. *Bartramia longicauda*. BARTRAMIAN SANDPIPER.—Common on the prairies and meadows, breeding in the grassy hollows on the prairies, often at a long distance from any water, but more frequently near the lakes or meadows. The nests were always very well hidden by arching the grass over them. Nests were found with eggs, on May 29, June 8 and 15, 1905, and on June 11, 1906. Downy young were found on June 24, 1906. The birds are very close sitters.

57. *Actitis macularia*. SPOTTED SANDPIPER.—Uncommon. One or two pairs were generally to be found breeding on the islands. They were also occasionally seen along the creeks. Two nests were found on June 14, 1906.

58. *Numenius longirostris*. LONG-BILLED CURLEW.—Tolerably common in scattered pairs on the prairies. Also sometimes seen in small flocks of from 5 to 7 birds about the lakes. Breeds in the grassy hollows on the prairies. No nests were found with eggs. Downy young were found on June 1, 1905, and on June 11 and 18, 1906. When large enough to run the downy young are adepts in the art of hiding; they seem to disappear entirely even in the short grass; after hunting carefully, for fully half an hour, over a limited area where we had seen one vanish, we gave it up and walked away, when we were surprised to see the youngster get up and run away from the very spot we had been hunting hardest. Both parents always showed remarkable devotion and solicitude in utter disregard of their own safety.

We saw an interesting exhibition of this one day which probably succeeded in saving the lives of the young from a prowling coyote. The curlew was decoying the coyote away by feigning lameness, flopping along on the ground a few yards ahead of him, but always managing to barely escape him. We watched them for some time until they finally disappeared over a hill, fully half a mile from where we first saw them.

59. *Squatarola squatarola*. BLACK-BELLIED PLOVER.—Abundant migrant. Large flocks were seen about Hay Lake on May 29, 1905, and scattering small flocks were seen as late as June 2, 1905.

60. *Oxyechus vociferus*. KILLDEER.—Common about all the lakes where it was evidently breeding, but we did not succeed in finding any nests. Downy young were found on June 13, 1906.

61. *Ægialitis semipalmata*. SEMIPALMATED PLOVER.—Dr. Bishop

and Dr. Dwight each took one and saw a number on the sand flats at the eastern end of Big Stick Lake on July 19, 1906.

62. *Ægialitis meloda*. PIPING PLOVER.—Abundant at Big Stick Lake, where it was breeding on the gravelly beaches. No eggs were found but downy young were found on July 21, 1906.

The few birds we collected were referable to *circumcincta*, but I doubt if this form is worthy of recognition.

63. *Pediceetes phasianellus campestris*. PRAIRIE SHARP-TAILED GROUSE.—Very common in the sandhills and among the willow thickets, especially near Crane Lake and along Bear Creek. Also seen and collected in the Cypress Hills. Three nests with eggs were found among the underbrush in the sandhills on June 3 and 6, 1905. A nest from which the young had just hatched was found on June 4, 1905, and recently hatched downy young were collected on June 23, 1906. Half grown young, able to fly, were seen on June 27, 1906.

The grouse that we collected, in worn summer plumage, were so dark colored that we thought they might be *phasianellus*, but on comparing them with summer specimens of *campestris* in Dr. Bishop's collection, taken in North Dakota, we decided that they were undoubtedly *campestris*. This decision was further confirmed by the examination of material in the Biological Survey collection at Washington.

64. *Centrocercus urophasianus*. SAGE GROUSE.—Probably occurs sparingly, but common farther south. In June, 1895, Prof. Macoun found these birds breeding on the White Mud River and traced the birds up the valley of this river to its source in the Cypress Hills.

A bird was seen by Mr. Day, near Skull Creek, on June 9, 1905, which we think must have been this species, but it was not positively identified and none were taken.

65. *Zenaidura macroura*. MOURNING DOVE.—Very common in the timber along the creeks where it breeds. Nests with eggs were found on May 30, June 12 and 14, 1905, and July 19, 1906. Young birds were found on June 25, 1906. We frequently saw small flocks of doves feeding in the stubble fields and along the roadsides.

66. *Cathartes aura*. TURKEY VULTURE.—Uncommon, but probably of regular occurrence and undoubtedly breeding somewhere in this region. We saw a few sailing over the timber on Skull Creek, near the Great Blue Heron rookery, on June 5, 1905, and at the same place on June 25, 1906. None were collected. One was seen at Many Island Lake on July 13; two were seen in the Big Stick timber on July 19, and two were seen in the Cypress Hills on July 27, 1906, by others of our party.

67. *Circus hudsonius*. MARSH HAWK.—Hardly could be called common, still frequently seen on the prairies. No nests were found.

68. *Accipiter velox*. SHARP-SHINNED HAWK.—Rare. None were seen in 1905 and only 3 in 1906, 2 of which were shot in the timber on Maple Creek, on June 30 and July 5, 1906.

Prof. Macoun recorded a nest found on Farewell Creek, in the Cypress Hills, containing heavily incubated eggs on June 27, 1895.



FIG. 1. NEST OF FERRUGINOUS ROUGH-LEG.

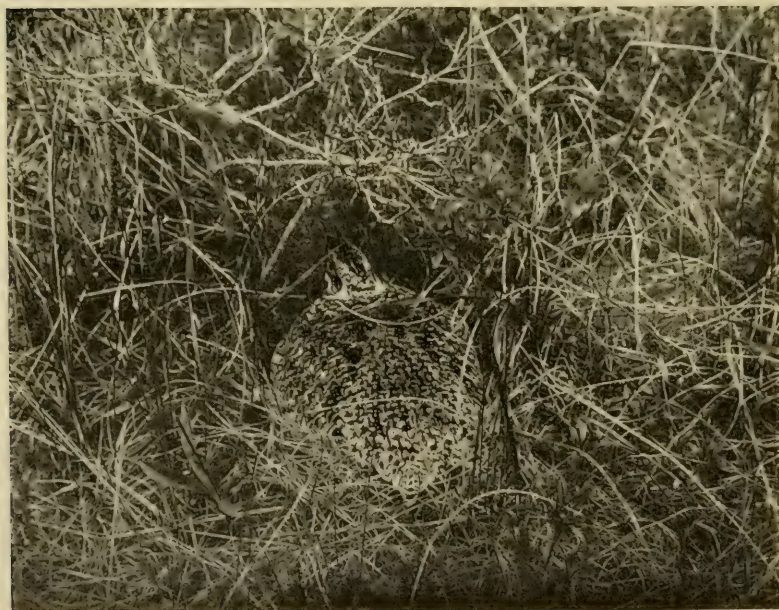


FIG. 2. PRAIRIE SHARP-TAILED GROUSE ON NEST.

69. **Buteo borealis.** RED-TAILED HAWK.—None of our party saw any Red-tailed Hawk of any form, either season, except a mounted specimen which Dr. Bishop saw in a local taxidermist's shop. It was shot somewhere in the vicinity of Maple Creek. He did not examine it closely but thinks it was nearer *calurus* than *krideri*. It was an immature bird. He and Dr. Dwight returned later to buy it, but it had been claimed by the party for whom it was mounted.

Prof. Macoun recorded the eastern form as breeding at Indian Head, so I have listed this bird as *borealis*, pending further knowledge on the subject.

70. **Buteo swainsoni.** SWAINSON'S HAWK.—The commonest hawk, breeding abundantly in all available timber, in isolated trees and even in bushes. One nest was found on a shelf on the face of a high sandbank. Thirteen nests were found in 1905 and 7 or 8 nests in 1906. Nests with eggs were found on the following dates: May 30, June 3, 5, 9 and 14, 1905, and June 11, 16, 18, 23 and 25, 1906. Nests with young were found on June 25 and 30, 1906.

It will thus be seen that these hawks are very late breeders; very few of their eggs were laid before June first.

The abundance of gophers in this region, provides a bountiful food supply for this and the following species, sufficient to support them in large numbers. Fortunately the ranchmen appreciate the value of these hawks in this respect and seldom disturb them, consequently they are very tame.

71. **Archibuteo ferrugineus.** FERRUGINOUS ROUGH-LEG.—Common. Breeding in large trees in the timber, in isolated trees along the creeks, and occasionally on the ground on buttes or rocky hillsides. The nests are very large structures, much resembling those of the Osprey. We found 7 nests in 1905 and only 3 in 1906, on the following dates: May 30, and June 4, 6, and 9, 1905, and June 27 and 28, 1906. All of these nests contained young, except one which was deserted and held broken eggs. Most of the young were hatched before the last week in May, and probably most of the eggs were laid before May first. Nearly half of the birds seen were in the melanistic phase and in two cases we found a light bird mated with a dark one. Two young were taken from a nest alive and reared in captivity, one of which developed into a melanistic bird and one into the light phase of plumage. (See Auk, XXIV, April, 1907, p. 213.)

72. **Aquila chrysaëtos.** GOLDEN EAGLE.—The only one seen flew almost within gunshot of us at Crane Lake on June 26, 1906. We could plainly see the golden hackles on its neck glistening in the sunlight, but did not succeed in shooting it.

73. **Haliaeetus leucocephalus alascanus.** NORTHERN BALD EAGLE.—Doubtful. "Up Maple Creek on July 5 we saw a large gray eagle, that we were all confident was a young *H. l. alascanus*. It was seated on the top of a high cut-bank about 300 yards away. We saw it quite plainly as it flew and it seemed much too light to be the Golden." (Bishop.)

74. **Falco mexicanus.** PRAIRIE FALCON.—We saw several large fal-

cons but they were very shy and we could not get near enough to identify them, much less shoot them.

Both this species and the Duck Hawk have been recorded, as taken and found breeding, at various points not far distant, and it is fair to assume that both species occur here on migration and a few may breed here. Probably they are more common along the banks of the Saskatchewan River where they can find suitable nesting sites.

75. **Falco richardsonii.** RICHARDSON'S MERLIN.—Rare. I shot an adult male near Hay Creek on June 1, 1905, and Dr. Bishop and Dr. Dwight secured an adult female on July 17, 1906, about 15 miles north of Maple Creek. Two or three others, supposed to be this species, were seen elsewhere. Prof. Macoun gives several records of its breeding in this region.

76. **Falco sparverius.** AMERICAN SPARROW HAWK.—Common in the timber along the creeks in 1905, but less common in 1906. We found 6 nests in 1905 and only one in 1906. Nests with eggs were found on May 30 and June 5 and 14, 1905, and on June 30, 1906. The nests were mostly in natural cavities in the box elders but some of them were in old Flickers' holes. Both sexes incubate.

The birds that we collected were all in worn breeding plumage and were referable to *phalæna*, but I doubt if this subspecies is worthy of recognition.

(To be concluded.)

FURTHER NOTES FROM EXTREME SOUTHERN ILLINOIS.

BY JOHN F. FERRY.

THE extreme southern end of Illinois was visited by the writer from August 10–24 inclusive to carry on an ornithological investigation for the Field Museum of Natural History, Chicago. The region studied is included in the Austroriparian Faunal Area of Dr. Merriam. The heat and humidity are extreme and a corresponding luxuriance of vegetation is the result.¹ The birds were found in greatest abundance in the deep woods bordering Cypress Swamps. Dense thickets bordering roads and fields were also favorite haunts, though during the intense heat of mid-day these were deserted for the cooler shade of the woods. Generally speak-

¹ For list of characteristic trees and shrubs of this region see Auk, Vol. XXIV, July 1907, p. 285.

ing, birds were surprisingly scarce. A few of the commoner varieties were met in great abundance, *i. e.*, Cardinals, Tufted Titmice, Northern Yellow-throats, Field Sparrows and Indigo Buntings, but often the woods seemed entirely deserted. The birds as a rule were moulting and very ragged in appearance. Young birds of the year were much commoner than the adults. The time in the field was spent as follows: Olive Branch, Aug. 10-17; Mound City, Aug. 18-22; Grand Chain, Aug. 23-24, all inclusive. When a bird is said to be "common," etc., and no locality is mentioned, the status thus given refers to its abundance in the general locality here discussed.

Through the courtesy of the U. S. Weather Bureau at Cairo, I am able to give the daily conditions of the weather.

Statement of Weather at Cairo, Ill.

Aug. 1907	Temperature.		Precipitation.	Wind.			State of Weather.	
	Maximum.	Minimum.		Prevailing direction of wind.	Total daily movement.	Highest daily velocity.	Character of day.	Percentage of cloudiness.
10	91	74	.23	E	140	18	Clear	20
11	91	74	0	E	87	7	Clear	0
12	84	69	.79	N E	180	24	Pt. Cloudy	60
13	83	66	0	N E	239	18	Clear	10
14	88	68	T	N E	180	18	Clear	30
15	86	71	T	S	179	12	Pt. Cloudy	60
16	88	74	T	S W	207	15	Pt. Cloudy	70
17	82	70	.15	N E	198	29	Cloudy	90
18	86	66	0	N E	94	7	Clear	10
19	89	71	0	S	123	10	Clear	20
20	82	73	T	N	162	16	Cloudy	90
21	73	65	.02	N E	219	18	Cloudy	100
22	73	64	T	N E	120	10	Cloudy	100
23	82	68	.17	S W	161	17	Cloudy	90
24	88	73	T	N	154	18	Pt. Cloudy	60

1. **Aix sponsa.** WOOD DUCK.—Breeding abundantly in Horse-shoe Lake, a body of water in Cypress Swamp near Olive Branch. The young of the year greatly predominated over the adults. Of four specimens all were ♀ *juv.* They feed near the borders of the cypress in threes and fours, and were not wary.

2. **Ardea herodias.** GREAT BLUE HERON.—Common about Horse Shoe Lake, and few seen at Mound City.

3. *Butorides virescens*. GREEN HERON.—Common at Olive Branch, Mound City and Grand Chain. Called here "Injun Hen."

4. *Nycticorax nycticorax nævius*. BLACK-CROWNED NIGHT HERON.—One seen at Horse Shoe Lake.

5. *Helodromas solitarius*. SOLITARY SANDPIPER.—One seen at Horse Shoe Lake.

6. *Actitis macularia*. SPOTTED SANDPIPER.—Two seen at Mound City.

7. *Oxyechus vociferus*. KILLDEER.—Two seen at Olive Branch.

8. *Colinus virginianus*. BOBWHITE.—Abundant at Olive Branch, where young varying from the size of an English Sparrow up to the size of adults were seen. The birds were frequently met in flocks of ten to fifteen. Bobwhites were common at the other places visited.

9. *Zenaidura macroura*. MOURNING DOVE.—Abundant in all places visited.

10. *Cathartes aura*. TURKEY VULTURE.—Common everywhere in this region.

11. *Accipiter cooperi*. COOPER'S HAWK.—One seen at Olive Branch.

12. *Buteo borealis*. RED-TAILED HAWK?—Several large hawks that could not be positively identified were referred to this species.

13. *Buteo lineatus*. RED-SHOULDERED HAWK.—A young bird shot at Grand Chain.

14. *Falco sparverius*. SPARROW HAWK.—One or two seen at each place visited.

15. *Syrnium varium*. BARRED OWL.—Abundant about Horse Shoe Lake. Frequently flushed in day time and all night its *who-who-who* would come booming out of the Cypress Swamp.

16. *Coccyzus americanus*. YELLOW-BILLED CUCKOO.—One taken. Cuckoos were frequently seen and heard, and possibly some of them were the Black-billed Cuckoo.

17. *Ceryle alcyon*. BELTED KINGFISHER.—Tolerably common at Horse Shoe Lake. One seen at Mound City.

18. *Dryobates villosus*. HAIRY WOODPECKER.—Tolerably common throughout the locality. Three specimens taken in August and one in February are intermediate between *villosus* and *v. auduboni*. They are nearer *auduboni* in size but in coloration they favor *villosus*.

19. *Dryobates pubescens medianus*. NORTHERN DOWNY WOODPECKER.—Abundant everywhere. Specimens taken in summer and winter are decidedly nearer *p. medianus* than *p. pubescens*, though they average smaller than northern Illinois birds. The average length (in millimeters) of wing of specimens from three different localities is given here: Florida and Louisiana, 87; Southern Illinois, 91; Northern Illinois and Connecticut, 92.

20. *Geophlœus pileatus abieticola*. NORTHERN PILEATED WOODPECKER.—One seen at Olive Branch. Local hunters report these birds tolerably common in southern Illinois. They are extremely wary.

21. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.— Common.
22. *Centurus carolinus*. RED-BELLIED WOODPECKER.— Abundant at Olive Branch. Common elsewhere. They were feeding on choke-cherries.
23. *Colaptes auratus luteus*. NORTHERN FLICKER.— Tolerably common.
24. *Chætura pelagica*. CHIMNEY SWIFT.— Common.
25. *Trochilus colubris*. RUBY-THROATED HUMMINGBIRD.— Profusely abundant at Olive Branch and common elsewhere.
26. *Tyrannus tyrannus*. KINGBIRD.— Common.
27. *Myiarchus crinitus*. GREAT-CRESTED FLYCATCHER.— Common.
28. *Sayornis phœbe*. PHŒBE.— Tolerably common at Olive Branch.
29. *Contopus virens*. WOOD PEWEE.— Abundant.
30. *Empidonax* sp. A little flycatcher of unknown identity was tolerably common at Olive Branch.
31. *Cyanocitta cristata*. BLUE JAY.— Rare at Olive Branch; common elsewhere.
32. *Corvus brachyrhynchos*. AMERICAN CROW.— Abundant.
33. *Agelaius phœniceus*. RED-WINGED BLACKBIRD.— Abundant at Olive Branch. The females and immature birds outnumbered the full-plumaged males about 15 to 1. Common at Mound City and Grand Chain.
34. *Sturnella magna*. MEADOWLARK.— Common at Olive Branch and Grand Chain. In the former place they spend the heat of the day in the dense fields of hog-weed which grows up to a man's shoulders.
35. *Icterus spurius*. ORCHARD ORIOLE.— Two seen at Olive Branch.
36. *Icterus galbula*. BALTIMORE ORIOLE.— Tolerably common at Mound City; one seen at Grand Chain.
37. *Quiscalus quiscula æneus*. BRONZED GRACKLE.— Common at Olive Branch and Mound City.
38. *Astragalinus tristis*. AMERICAN GOLDFINCH.— Common.
39. *Coturniculus sandwichensis passerinus*. GRASSHOPPER SPARROW.— One male in worn plumage taken at Olive Branch.
40. *Spizella pusilla*. FIELD SPARROW.— Profusely abundant.
41. *Pipilo erythrophthalmus*. TOWHEE.— One seen at Olive Branch and Grand Chain.
42. *Cardinalis cardinalis*. CARDINAL.— Abundant.
43. *Cyanospiza cyanea*. INDIGO BUNTING.— Profusely abundant. Moulting.
44. *Spiza americana*. DICKCISSEL.— Common at Mound City.
45. *Piranga erythromelas*. SCARLET TANAGER.— One taken at Mound City.
46. *Progne subis*. PURPLE MARTIN.— Common.
47. *Petrochelidon lunifrons*. CLIFF SWALLOW.— Common at Olive Branch and Grand Chain.
48. *Riparia riparia*. BANK SWALLOW.— Common at Olive Branch and Mound City.

49. *Lanius ludovicianus migrans*. MIGRANT SHRIKE.—Several Shrikes seen at Mound City and Olive Branch are tentatively referred to this species.

60. *Vireo olivaceus*. RED-EYED VIREO.—Common. Moulting and mostly immature birds.

61. *Vireo noveboracensis*. WHITE-EYED VIREO.—The most characteristic bird of the thickets bordering the woods. It has a very pleasing and unique song. It is a rolling trill, with a flute-like quality. While listening to the song I wrote it thus: *Twe-wa-ra, ra-re-ra*.

62. *Mniotilta varia*. BLACK AND WHITE WARBLER.—Common. Both adult and immature birds taken. They were found in deep woods.

63. *Protonotaria citrea*. PROTHONOTARY WARBLER.—Abundant. All young birds had the fully adult plumage.

64. *Compsothlypis americana ramalinæ*. WESTERN PARULA WARBLER.—These birds were tolerably common at Mound City. They kept to the tree tops in the river bottoms and in company with Cerulean Warblers. Three specimens, including immature as well as a fully plumaged adult, are typical of this subspecies. I believe that a considerable portion of the small flitting forms high up in the trees were of this species. Several times the faint, insect-like trill *za-zo-za, zee-zee* of this bird was heard.

65. *Dendroica æstiva*. YELLOW WARBLER.—Two young birds seen at Olive Branch on the 11th.

66. *Dendroica cærulea*. CERULEAN WARBLER.—One taken at Olive Branch in dense timber. It was abundant in the cottonwood and willow bottoms along the Ohio at Mound City. Small bands of them were found flitting about the tree tops, betraying their presence with their faint lisping notes, or by occasional snatches of their song. The latter may be represented thus: *wee-la-le, zee-ee-e-e-e*.

67. *Seiurus motacilla*. LOUISIANA WATER-THRUSH.—Two seen at Olive Branch. One taken.

68. *Oporornis formosa*. KENTUCKY WARBLER.—One taken at Olive Branch, 3 at Mound City. Two were taken at one shot at the latter place. The adult was feeding the immature bird, though the offspring was as large as the parent.

69. *Geothlypis trichas brachidactyla*.—NORTHERN YELLOW-THROAT.—These birds were everywhere profusely abundant and their sharp 'chip,' sounded from nearly every thicket and weed patch. Very few adult males were seen and most of the birds taken were moulting.

70. *Icteria virens*. YELLOW-BREASTED CHAT.—These shy birds were tolerably common at Olive Branch and 3 were seen at Mound City. They inhabited the densest thickets.

71. *Wilsonia mitrata*. HOODED WARBLER.—One taken along Cache Creek, near Mound City.

72. *Setophaga ruticilla*. REDSTART.—Tolerably common. Only 3 adult males were seen, the rest were immature or females.

73. *Mimus polyglottos*. MOCKINGBIRD.—Abundant at Grand Chain, but inexplicably absent from other localities visited.

74. *Galeoscoptes carolinensis*. CATBIRD.— Tolerably common; moulting.
75. *Thryothorus ludovicianus*. CAROLINA WREN.— Abundant. In song.
76. *Certhia familiaris americana*. BROWN CREEPER.— A single specimen of this bird was seen at Olive Branch on Aug. 11 creeping along trunks of cypress and tupelo trees.
78. *Sitta carolinensis*. WHITE-BELLIED NUTHATCH.— Common.
79. *Bæolophus bicolor*. TUFTED TITMOUSE.— Abundant. Many young and moulting birds seen.
80. *Penthestes carolinensis*. CAROLINA CHICKADEE.— Abundant in small bands.
81. *Polioptila cærulea*. BLUE-GRAY GNATCATCHER.— Tolerably common. Young birds predominated.
82. *Hylocichla mustelina*. WOOD THRUSH.— Common. Singing at Olive Branch.
83. *Sialia sialis*. BLUEBIRD.— Tolerably common.

GENERAL NOTES.

The Kittiwake and Purple Sandpiper again in Maine in Summer.— In 'The Auk' for July, 1907 (Vol. XXIV, p. 337) the capture of a Kittiwake in 1903 on the coast of Maine in summer was recorded. On July 14, 1907, while at Jordans Rock, a submerged ledge one mile S. E. by E. of Portland Head Light, a Kittiwake (*Rissa tridactyla*) flew over my boat within easy range. The small size of the bird, white head, and short black legs and feet were distinctly and critically observed as it passed over. It flew toward Grundys Reef until it disappeared.

In the 'Journal of the Maine Ornithological Society,' Vol. VI, p. 16, the capture of a specimen of the Purple Sandpiper (*Arquatella maritima*) at Metinic, Me., on August 11, 1902, was recorded. On August 6, 1907, while on Metinic Green Island, I saw another specimen of this bird. It stood on a large rock (behind which the greater part of my body must have been concealed from it), within three yards of me. I observed it critically, then tried to catch it; it flew readily, but showed the flight feathers to be faded and worn, and nearly ready to be moulted. Its tameness was in part due, I believe, to the drenching rain which was falling.— ARTHUR H. NORTON, *Portland, Me.*

That Cinnamon Teal Record from Florida.— Unfortunately for Mr. William Brewster's theory of no reliable records for this species from the Southeastern States, my former note in 'The Auk' of a specimen from

Lake Iamonia, Florida, is indisputable. The specimen is an adult male in nuptial plumage and is now in the Museum of the Academy of Natural Sciences, Philadelphia. The gentleman who shot the bird and the taxidermist who mounted it in Philadelphia are known to us here. I examined it freshly skinned.—S. N. RHODES, *Haddonfield, N. J.*

The Snowy Heron in Camden County, N. J.—On July 16, 1904, I saw a fine adult Snowy Heron (*Egretta candidissima*) near Delair, Camden County, N. J., feeding with an immature Black-crowned Night Heron on the Pea Shore Flats of the Delaware River. It allowed us to approach quite close in our boat and reluctantly took wing as we rowed in closer and closer, preceded by the more wary Squawks, and both birds flew into a small grove of trees on the shore.

This is the first authentic record of the occurrence of the Snowy Heron in the Delaware Valley in recent years, and as the bird was well seen at a distance of less than fifty feet there can be no doubt as to the correctness of my identification. I am positive of it, and would inform the incredulous, who may be inclined to think that the bird I saw was an immature Little Blue Heron (*Florida caerulea*), that I am well acquainted with the distinguishing marks of the two species and recognized the bird at once as the Snowy Heron. Furthermore, I have been hunting for this bird for several years, but only to run across one without a firearm of any sort. Hard luck, truly, but this seems to be a frequent misfortune of mine, possibly because I am not of a collector of skins and seldom carry a gun, for I have on several occasions stumbled upon rare birds and wished in vain for a gun.

A few words regarding the status of the Snowy Heron in the Delaware Valley will not be amiss in this connection. In Stone's 'Birds of Eastern Pennsylvania and New Jersey' it is given as a "straggler from the South" (page 63); and yet Chapman, in his 'Handbook,' says it breeds as far north as Long Island. This is a rather singular statement in these days, although it may have bred there formerly. However, now it is a rare transient everywhere north of 39° north latitude at least.

Evans in his excellent paper on 'The Unusual Flight of White Herons in 1902' (see 'Cassinia' for 1902, page 15) does not mention a capture or a record of the Snowy Heron, nor are there any subsequent records. The Snowy Heron, then, can rightly be regarded as a "rare straggler" in the Delaware Valley, at least.—RICHARD F. MILLER, *Harrowgate, Philadelphia, Pa.*

American Coot (*Fulica americana*) Nesting near Newark, New Jersey.—In 'The Auk,' XXIV, pp. 1-11, I recorded the nesting of the Pied-billed Grebe (*Podilymbus podiceps*) and the Florida Gallinule (*Gallinula galeata*) in the marshes near Newark, N. J.; also, the presence in the same marshes of the American Coot, although no nest of this species was discovered. On May 30, 1907, I visited the same marsh area in company with Messrs. J. P. Callender, P. B. Philipp, R. H. Southard, and T. F. Wilcox — all

members of the Linnaean Society of New York. I am pleased to record that a nest of the American Coot containing eight eggs was discovered by Mr. Wilcox, thus establishing this bird as a nesting species within seven miles of New York City Hall.

In other respects conditions in the marsh-bird colony were found to be much the same this year as those described in the above mentioned article.

—CLINTON G. ABBOTT, *New York City*.

The Stilt Sandpiper in Massachusetts. — While looking over the 'General Notes,' in the July issue of 'The Auk' I noticed a reference to the Stilt Sandpiper (*Micropalama himantopus*) in Massachusetts. I think the rarity of this species in this State has been greatly exaggerated in this note.

On September 20, 1903, while gunning at Chatham with a friend, a flock of about a dozen Stilt Sandpipers flew over us, and we each secured a pair. Since then both my brother and myself have seen numbers of these birds in the big market in Boston, which were shot along the south shore in the vicinity of Chatham and Monomoy.

Thus it seems to me that the Stilt Sandpiper is not so rare in Massachusetts as Mr. Nash believes and states it to be. I would like to hear from other Massachusetts men in regard to the prevalence of the Stilt Sandpiper in this State.—WINTHROP S. BROOKS, *Milton, Mass.*

The Buff-breasted Sandpiper (*Tryngites subruficollis*) on Long Island, N. Y.—Owing to the infrequent occurrence of this species on the Atlantic coast, I wish to record a young male in my collection taken at Rockaway Beach on Sept. 11, 1906.—J. A. WEBER, *New York City*.

American Goshawk (*Accipiter atricapillus*) versus Man and Barred Owl. — Two incidents, illustrating at once the ferocity and the "lack of judgment," so to say, of the Goshawk, have lately come to the writer's notice. About May 15, 1905, Mr. Ferdinand Lack, a farmer of Germanicus, Renfrew County, Ontario, had occasion to go into an old, little visited pasture on his farm, lying along an extensive piece of woods. Suddenly a large hawk swooped down upon him, flew around his head in most threatening and uncomfortable proximity, at the same time striking at him with wings and claws, as if it wanted to arrest his progress. In this the hawk was successful, the man could not proceed. The next day the farmer wanted to resume his interrupted inspection of the pasture, and thinking that the experience of the day before would probably remain unique, took no weapon of any kind along. But the same thing happened again. He had to turn back again, as he could hardly dodge the vicious onslaughts of the bird. The inspection of the meadow had to remain incomplete again. Once more the farmer sallied forth the following day, but this time in the company of his gun. But even the sight of this did not deter the bird from making his usual assault with the result, of course, that it was speedily put out of commission by a shot from the farmer's gun. He

gave the fine hawk to a friend of the writer, who has taxidermic propensities, when it was identified as the Goshawk. This bird probably had its nest in the woods along the pasture.

A more remarkable instance came to the writer's notice at High Falls, Wright County, Quebec, fifty miles northeast of Ottawa. There, one morning last February, Mr. Hugo Paeseler, a farmer, on going out into the woods adjoining his farm, noticed a space of about ten to fifteen feet square, where the snow had recently been much disturbed, deeply plowed up from some great commotion. That a fierce fight had been going on but a short while before was evident from the liberal quantities of blood sprinkled on the snow and the masses of feathers, single and in whole bunches, lying about and adhering to bushes and trees. On looking around for the principals of the fight, he found about ten feet away in one direction a Goshawk, lying on the snow with wings extended and frozen stiff. About ten feet away from the scene of hostilities, in the opposite direction, he found an owl, more damaged than the hawk, but still warm. It had alighted after the fight on a small spruce and fallen off, as the snow showed, and with its last strength crawled into a small log, lying with its hollow part conveniently near. The farmer took both along home, skinned and "stuffed" — here that term is appropriate — the hawk, and also the head of the owl, which was all he could make use of in her case. When the writer saw them at the farm house, they turned out to be the Barred Owl and the American Goshawk. It must surely have been a battle royal, if one could only have witnessed it. The farmer, quite a shrewd observer, tells me, that the same hawks are there winter and summer, which is, of course, not to be wondered at, the place being right in the Goshawk range. The writer's theory is, that the Goshawk, hungry and ill at ease from the severe cold, while looking for its breakfast, encountered the owl, then peacefully returning from its nightly foraging. In its usual injudiciousness, courage, fierceness, or whatever one may call it, he pounced down upon the owl, which, however, had no desire to be made a meal of, and defended herself so valiantly, that both had no more use for breakfasts.— G. EIFRIG, *Ottawa, Ontario*.

Unusual Occurrence of the Short-eared Owl in Pennsylvania.— The Short-eared Owl (*Asio accipitrinus*), is a rather frequent migrant and winter resident in this section, occurring in small flocks wherever there is a sufficient abundance of *Microtus*. Here they remain until about the first of April, when they usually wend their way further north. This year, however, was an exception, at least with one pair which I had the fortune to observe.

The first evidence of mating was noticed on March 28, when they were noted sailing about in the dusk, occasionally giving vent to a peculiar call — *whaq*, with a nasal intonation. They were frequently heard during the first ten days of April but no more were seen until April 19, when in crossing a weedy field I flushed a fine specimen and observed it sailing about for some time.

No more was seen of the owls and I had almost forgotten them when about six P. M. on the night of May 28 I was astonished to observe one fly close by our residence, uttering its peculiar call. The next morning I tramped over several miles of suitable fields but could not flush any and none have been observed since.

The bird is so rare about Philadelphia after April 15 that this record seems to demand attention.—RICHARD C. HARLOW, *Edge Hill, Pa.*

The Breeding of the Short-eared Owl (*Asio accipitrinus*) near Ann Arbor, Michigan.—The Short-eared Owl is a common migrant in this locality, but although a hunter once told me of finding a nest here I have had no positive proof that it breeds in this vicinity until this summer. On June 26, 1907, there was brought to me three immature specimens of this species, which had been taken in a grassy marsh seven miles south of Ann Arbor. On these birds the down was still present in places, and the wing and tail feathers were only partly out of the sheaths so that only short flights could be made. The collector did not look for the nest, which was no doubt near by. The skin of one of these birds is preserved in the University Museum.—NORMAN A. WOOD, *University Museum, University of Michigan.*

Mortality among Kingfishers.—While digging out some Kingfishers' nests this season I was surprised to find a dead bird in about every fourth or fifth hole. This I was at loss to account for, as the birds showed no signs of combat or disease, while the plumage was not even disarranged. The bodies, though, seemed to be dried up, with no signs of blood in them, so I presumed that something had crawled into the holes and sucked the blood from them, leaving the carcass intact. This surmise proved correct, as the last hole I dug out contained a large black snake, and a dead kingfisher still warm. The snake measured about four and a half feet long and had evidently gone in for the eggs, any kind of eggs being readily devoured by this snake in this section. The holes were generally from two to three feet below the top of the bank, so it was an easy matter for them to get down from the top. I found no less than six dead birds within a mile, and if all of the river bank gave the same average, the loss of life must have been great. I am at loss, however, to account for their molesting the kingfishers and not the Rough-winged Swallows, which also nested abundantly in the same bank. Snakes are more numerous this year than ever before.—H. H. BAILEY, *Newport News, Va.*

The American Crossbill in Camden County, Ga.—On November 12, 1906, I noticed American Crossbills (*Loxia curvirostra minor*) here (Camden County) for the first time. While riding through a pine forest with hardwood underbrush I flushed 15 or 20 from a small open pond where I presume they were getting water. They flew to the tops of the tall pines,

and I watched them for some time feeding on the pine cones. Never having seen the bird in life before, I had some trouble in making out what they were, but at last decided that they were Crossbills. After that I often saw them, and in fact they became quite common, and remained here until the middle of May. I only killed one (an old male) and now have the skin in my collection. Whenever seen they were invariably in the pine trees and never still long at a time.—I. F. ARNOW, *St. Marys, Ga.*

Nesting of Crossbills in Colorado.—The paper by Rev. P. B. Peabody in the July number of 'The Auk,' on the nesting of the Bendire Crossbill in Wyoming led me to look through the notes of Denis Gale, who spent the years from 1883 to 1893 inclusive in the mountains of Boulder County closely observing our mountain birds. These notes are now owned by the University of Colorado, and have been transcribed, annotated and indexed for convenient reference, forming 278 pages, exclusive of index. I find few references to Crossbills, and only in 1893 are there definite notes of their nesting habits, though under date May 21, 1890, he does say that he saw that day a family of these birds with "young fully grown nearly." All of his references are to the American Crossbill, but doubtless those he saw were *Loxia curvirostra bendirei*, a subspecies likely unknown to him. He was well along in years at that time, and had learned his ornithology at a much earlier period. I extract the following from his notes:

"March 28, [1893] 172 [= Smithsonian Check List No., Bull. 21, U. S. Nat. Mus., 1881]. In this locality saw crossbills to all appearances looking for exact site or having already begun to build, but not in earnest, as I watched them a long time without results."

"March 31. 172. The pair of crossbills noted on the 28th inst. were evidently resting from their labors, having completed their nest building. Now I come to think of it their demeanor said as much. I regret not witnessing the building operation which I believe was wholly undertaken by the female. Locality, a sheltered hillside east of Buckhorn Mountain, on north side of clump of scattered coniferous trees, in pine tree about 18 feet from the ground, saddled on horizontal branch 5 feet from main stem and 4 feet from end of branch, the nest shielded on the weather side by part of another branch from below, and yet immediately underneath the nest could be easily seen, although the site would be easily overlooked, if indeed it would be examined at all, it being in a general way the least likely tree to be selected for nesting, a number of others more sheltered and offering better hiding being at hand. Upon approaching the belt of scattered timber I stood several minutes looking to the center of further edge to see if I could discover the bird carrying building material, in which direction I had supposed the nest site selected from the manner of the birds I had previously watched, instead of which I was within a few feet of the tree the nest was located in. The male suddenly lit upon the top of a tree. At a greater distance no doubt he had seen my intrusion and become alarmed. I saw at once by his anxious manner that he was to be watched,

so I stood still, keeping him in view. In two minutes he flew a little quartering toward me to another tree top, and in less than half a minute flew toward the nest site and when within two feet of it the female joined him and flew off. The apparition of the female led me to examine the location of her exit from the tree, when I plainly saw the nest. Intending to watch matters I walked off 20 or 25 yards and sat down. Upon doing so I saw the male on a twig close to the nest. I did not see the female at all, whom he must have conducted back to the nest. His stay there was momentary. I only had time as I turned around to get a glimpse of him as he flew away. Still of opinion that they were building or completing their nest I waited and watched for nearly two hours and went away intending to return. Upon my return, as before I went away, I struck the tree trunk and some of its lower branches, but the female did not flush. I climbed the tree and discovered the female sitting close. I reached out and rudely shook a spray with two or three pine tassels on it which were immediately over the nest, to no purpose. She trembled but would not fly off until I poked her with my finger. She was covering two eggs. After leaving the nest I watched. It was fully ten minutes from one tree top before she crossed the site to another tree and after two minutes more she again settled on the nest. I did not see the male anywhere about except for an instant, after his unnecessary anxiety gave his mate away. While building the nest I believe, as with some other birds, this species' nest can be located, and in no other way unless given away by the male. Accident brought the male to the nest locality just as I happened to be near the spot, otherwise it was 100 chances to one I had not discovered it."

"April 3. 172. Took nest and 3 eggs to-day. Watched the male feeding female at long intervals, $1\frac{1}{2}$ to 2 hours. He seemed to fly some distance away. Was not present when the nest and eggs were taken. Eggs were covered from the first laying, to prevent their being chilled I presume. The male seemed very devoted to his mate and likewise the female to her nest and eggs. Measurements of nest as follows: 5 in. wide, $2\frac{1}{2}$ in. deep, outside; $1\frac{3}{4}$ in. deep, $2\frac{3}{8}$ in. wide, inside. Dimensions taken on the spot, therefore correct. Composition of nest: Foundation a few twigs, with stiff, strong plant stems, some of the latter stayed through the body or wall in which is felted a few fine grass stems, with much plant fiber, species of wild hemp [?], the same somewhat finer with a few feathers felted in for inside lining, which feels a little harsh. The structure is light but well knit together; warm, without being very dense. Should think it took at least a week to construct. Saddled upon bough $1\frac{1}{2}$ inches thick, well protected by laterals. Eggs slightly incubated. No additional eggs intended. Measurements of eggs: .69 + .44, .70 + .44, .72 + .54 in."

"May 8. 172. At Fred Ehler's and on hillside, Zieman's Gulch, saw young and old birds together feeding on pine seeds, the old birds searching the pine cones."

Although Mr. Gale spent most of his time in the field during the nesting

season these are the only definite notes connected with the nesting of the crossbills in all the 278 pages. I may add that although I spend a little time in the coniferous forests of our mountains up to timber line each year I have never seen any crossbills. Dr. Ridgway, in Part 1 of his new work on 'Birds of North and Middle America,' notes several breeding records of *L. c. bendirei*, published under the names *L. c. americana* and *L. c. mexicana*.—JUNIOUS HENDERSON, *Boulder, Col.*

Occurrence of a White-winged Crossbill at Oxen Hill, Md. in August.—On August 13, 1907, Mr. Ernest Kletsch, of the Department of Agriculture, brought me a White-winged Crossbill (*Loxia leucoptera*) that had been accidentally killed the day previous at Oxen Hill, Maryland, about four or five miles southeast of Washington, D. C. Taken in connection with the record (mentioned elsewhere in these notes by Nelson R. Wood) of a White-throated Sparrow in the grounds of the Smithsonian Institution at about the same time, this occurrence of a northern bird in midsummer in the vicinity of Washington suggested a possibility of special significance, but no further unusual records have come to my attention and I merely mention the incident as a curious instance of irregularity. It would be of interest to know if similar observations were made elsewhere.—HENRY OLDYS, *Washington, D. C.*

The Vesper Sparrow (*Poæetes gramineus*) on Long Island, N. Y., in Winter.—In order to confirm Mr. J. T. Nichols's observation published in 'The Auk,' Vol. XXIV, p. 220, I wish to record four specimens in my collection taken on Feb. 7, 1905, near the northern part of Jamaica Bay, from a flock of these birds found roaming the snow covered fields.—J. A. WEBER, *New York City.*

A White-throated Sparrow in Washington, D. C., in August.—On the morning of August 9 a White-throated Sparrow (*Zonotrichia albicollis*) flew down into the grass near where I was sitting and remained in plain view for some time, about fifteen feet from me. It was in moult, as a part of its tail was gone. Wishing other witness to this, I asked Mr. William Palmer to visit the spot. He, too, saw it. The next morning found me, with field glass in hand, again at the place, and to my joy the bird was still there. I called Mr. Oldys, who was passing, and handed him the glass. He also saw and identified the bird. Is it not unusual for this bird to be here in this season, and does it not point to the fact that birds migrate when in moult?—NELSON R. WOOD, *Washington, D. C.*

Nesting of the Rose-breasted Grosbeak in Philadelphia County, Pa.—The Rose-breasted Grosbeak (*Zamelodia ludoviciana*) was formerly regarded as a migrant of transient occurrence in the Lower Delaware Valley (see Stone's 'Birds of Eastern Pennsylvania and New Jersey,' page 6), and not until late years was it found to be a summer resident of the Carolinian

fauna, as it was considered a characteristic bird of the Alleghanian and Canadian faunas, particularly of the former zone.

The first nest, I believe, to be recorded from the Carolinian fauna was discovered by Mr. J. Harris Reed at Beverly, Burlington County, N. J., (see Auk, 1897, p. 323), and the second was found by G. H. Moore at Haddonfield, Camden County, N. J. This nest and eggs was acquired by the Delaware Valley Ornithological Club of this city for its matchless collection, and its discovery was reported at the February 2, 1899, meeting of the Club.

Reed has also found the Rose-breasted Grosbeak nesting in Upper Makefield township in Bucks County, Pa., and I have found it to be a summer resident in Bensalem township in the same county, in the vicinity of Cornwell's Station, where, also the Scarlet Tanager breeds. And further investigation would no doubt reveal the bird as a breeder at other localities in the Carolinian fauna, as it appears to be becoming a regular resident in various parts of this zone.

On May 28, 1907, I found a nest of the Rose-breasted Grosbeak at Torresdale, Philadelphia County, Pa., which is the only record of a nest for this county, and the most southern record for Pennsylvania which I have been able to find.

Until I found my nest Reed held the next record for southern nesting of the Rose-breast, but his record must now be accorded third place, as the nest I found is several miles further south.

The nest I found was collected with two fresh eggs. It was situated 6 feet up in a many-forked elder bush, in a thicket of elder, alder and spice bushes along the Poquessing Creek, bordering a wood of deciduous trees.

If there are any other records of the nesting of the Rose-breasted Grosbeak in the Carolinian fauna I should be glad to hear of them.—RICHARD F. MILLER, Philadelphia, Pa.

An Intergrade between *Helminthophila pinus* and *H. leucobronchialis* captured in Hyde Park, Mass.—This bird, a male, was discovered by me on the morning of June 13, 1907, on a hillside covered by a dense growth of low oaks and birches, in the town of Hyde Park, Mass. I was drawn to the bird by his song, which was identical with that of the Golden-winged Warbler, being sometimes composed of three notes, *zee, zee, zee*, sometimes of four, and once only of two. I thought likely that it might be breeding here, but I could find no trace of the nest, so I decided to return in the afternoon and shoot the bird if it could be found, in order that a proper examination and record of it might be made.

I returned about three o'clock and shot it near the place where I had seen it in the morning. The description and measurements of this specimen are as follows:

Crown yellow, with a few dark feathers. Back and wings greenish yellow, some of the wing feathers being bluish gray edged with greenish. Tail bluish gray above, the three outer pairs of feathers partly white.

Both wings and tail light gray underneath. Two yellow bars on each wing, not so broad as in *H. chrysoptera*. A black line through the eye; sides of neck a little whitish; chin, throat, breast, sides, and belly decidedly yellow, this color being strongest on the breast. Some bluish gray feathers on the upper back and wings. Eyes hazel. Bill black. Tarsi and feet greenish black. Length, 5.05 in.; extent, 7.75; wing, 2.40; tail, 1.90; tarsus, .75; middle toe, .50; bill, .40. This specimen is now in my collection.—H. G. HIGBEE, *Hyde Park, Mass.*

Additional Notes on the Brewster's Warbler in the Arnold Arboretum, Jamaica Plain, Mass.¹—The five eggs hatched June 15; the young left the nest June 22, after remaining in the nest but seven days. This tallies exactly with what I observed in a nest of *Helminthophila chrysoptera* in Arlington, Mass., in 1897: the five eggs hatched June 8, the young quit the nest June 15.

An agent was sent from the Museum of Comparative Zoölogy on the 22d to collect the young birds and the two parents, but he was forbidden by the authorities of the Arboretum to shoot any of them. The nest is now in the Museum (No. 5083). The parent birds in this case were, as far as I could see, a normal male *H. leucobronchialis* without any yellow below, and a female *H. chrysoptera* (essentially), the only abnormal mark that I could detect on her being a blackish line bounding the gray cheek patches above and separating them from the white superciliary streaks. The five eggs, it may be noted, were dark-spotted near the larger end and appeared like those of *H. chrysoptera*.—WALTER FAXON, *Lexington, Mass.*

***Helminthophila leucobronchialis* (Brewst.) in Lexington, Mass.**—On the 14th of June, 1907, while walking in company with Dr. Winsor M. Tyler through a hillside pasture sloping down to a wooded swamp in the town of Lexington, Mass., I came upon a male Brewster's Warbler in full song. This bird was often scrutinized by Dr. Tyler and myself at short range and with the aid of powerful glasses, from this time forth up to the end of June, about which time it stopped singing and disappeared from view. It wore the pure, unadulterated *leucobronchialis* dress, revealing not the slightest trace of yellow on the lower parts, even when seen at close quarters and by the aid of the most favorable light. Its crown was bright yellow, lores black, this color continued behind the eye as a short, thin postocular streak (as in *H. pinus*). Back gray (as in *H. chrysoptera*). Wing-patch yellow, indistinctly divided into two bars. Lower parts silk-white, purest on the chin and throat.

There were two male *H. chrysoptera* in the immediate neighborhood—so near that all three could be heard singing at the same time. The Brewster's Warbler had two different songs, absolutely indistinguishable from two of the songs of the Golden-winged Warbler. The first of these

¹ See Note by Helen Granger, in the July number of 'The Auk,' p. 343.

was the familiar *zee, zee, zee, zee* of *chrysoptera* varied at times by docking one or two of the last notes. The second song may be represented thus: — *ti-ti-ti-ti-ti, zee*, the preliminary notes (sometimes increased to as many as eight) delivered rapidly and without any of the buzzing quality of the long, higher, final note. This song also was indistinguishable from the second song of the Golden-winged Warbler.

Let us now compare the song of this bird with what has hitherto been recorded concerning the song of Brewster's Warbler. The type specimen (Newtonville, Mass.) was singing the first song of *chrysoptera* when it was shot (*test.* Brewster and Maynard). The Arnold Arboretum bird recorded by Miss Granger in the last number of 'The Auk,' usually sang the same song (*zee, zee, zee, zee*) but on one occasion it was heard singing the second song, described above, several times in quick succession (Miss Granger, *in litt.*). The intergrade between *H. pinus* and *H. leucobronchialis* shot by Mr. Higbee in Hyde Park, Mass., on June 13 of this year (see Mr. Higbee's note above) sang the first, ordinary song of *chrysoptera*. In brief, the few observations on the song of Brewster's Warbler in Massachusetts disclose no differences between it and the Golden-wing. Connecticut observers, on the contrary, find that in that State Brewster's Warbler sings sometimes like *chrysoptera*, sometimes like *pinus*, while Mr. Eames (Auk, VI, 309) and Mr. Sage (Auk, X, 209) aver that at times it utters notes peculiar to itself. But are Mr. Eames and Mr. Sage familiar with the second, less often heard song of *chrysoptera*? If not, the "peculiar" notes may prove to be those of the Golden-wing.

In this connection it may be worth while to complete the account of the musical repertory of *H. chrysoptera*. One bird, observed last June, varied his score by combining the first and second songs into one long and varied melody,— *zee, zee, zee, zee, ti-ti-ti-ti-ti-zee*; another, discovered by Dr. Tyler near the Lexington Golf Links, sang in addition to songs 1 and 2, a third peculiar song, two long-drawn notes, *zee, zee-e-e-e*, the second note higher than the first and delivered with a quaver. This song No. 3 singularly suggested the ordinary song of *H. pinus*, though the relative pitch of the first and second notes was reversed.

On one occasion we heard the second song given when the bird was on the wing, and modified by that rapturous delivery which goes with the flight songs of birds. The author of this song was probably the Brewster's Warbler, though the proximity of two Golden-wings at the time made this a little uncertain.

It was my intention to secure the Brewster's Warbler at last, but I delayed shooting so long in the hope of finding through him his mate, nest, or young, that he eluded me by lapsing into silence.

This is the fourth specimen of Brewster's Warbler in Massachusetts. The other records are, Hudson, May or June, 1858, ♂, Sam'l Jillson, now in the collection of Williams College (Purdie, B. N. O. C., IV, 184); Newtonville, May 18, 1870, ♂, the type, W. Brewster (Amer. Sportsman, V, Oct. 17, 1874, p. 33); Jamaica Plain, May 19, 1907, ♂, Helen Granger

(Auk, XXIV, 343). Of these the type specimen (in Mr. Brewster's collection) has a very faint tinge of yellow on the breast, the others showed no trace of yellow on the lower parts. Then there is the specimen recorded in this number of 'The Auk,' Hyde Park, Mass., June 13, 1907, ♂, H. G. Higbee, which is midway between *H. pinus* and *H. leucobronchialis*, heavily washed with yellow from the base of the bill to the under tail coverts.—WALTER FAXON, *Lexington, Mass.*

A Correction.—In Mr. Ridgway's 'Birds of North and Middle America,' Part II, 1902, p. 572, the citation "*Dendroica cærulea* Loomis, Auk, VIII, 1891, 170 (Chester Co., South Carolina, Apr. 15 to May 3 and Oct. 4 to 26)" should be cancelled and transferred to the Cape May Warbler (*Dendroica tigrina*). The correct citation for *Dendroica cærulea* is "Loomis, Auk, VIII, 1891, 170 (Chester Co., South Carolina, April 13 to 30, and Aug. 8 to Oct. 22)." — ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

The Northern Water-Thrush again Nesting in Massachusetts.—In 1905 I recorded in 'The Auk' the nesting of the Northern Water Thrush (*Seiurus noveboracensis*) in Lancaster, Mass. I found two sets of eggs, May 21, 1905, well incubated.

This year, June 23, 1907, not in the same swamp, but near it, I found a brood of young of this species that could fly. I shot one. It would seem to establish the fact that this bird breeds regularly in this locality.

The eggs must again have been laid early in May, despite the cold spring and the late arrival of the north-bound migrating Water-Thrushes.—JOHN E. THAYER, *Lancaster, Mass.*

A Mockingbird (*Mimus polyglottos*) in Lexington, Mass., in Winter and Summer.—A Mockingbird appeared near my house in Lexington on the 8th of February, 1907, and was seen by me at intervals up to the 29th of March. On the 31st of March and the 4th of April a Mockingbird, doubtless the same one, was seen by several persons in another part of the town, about a mile to the eastward. He was neither seen nor heard again until the 9th and 10th of July, when he reappeared near my house. This bird sung at the end of March, early April, and on both the days when he was seen in July. He was an unusually fine singer, even for a Mockingbird. Among his very perfect imitations the notes of the Phoebe and Great Crested Flycatcher were conspicuous. The winter of 1906-07, it should be remembered, was an unusually cold one in eastern Massachusetts.—WALTER FAXON, *Lexington, Mass.*

The Great Carolina Wren in Southern Rhode Island.—As has been previously noted in 'The Auk' by the present writer, this bird has been within recent years known to summer in southern Rhode Island. Last year and year before (1905-1906) there was no indication of his presence in the neighborhood of Peace Dale in South Kingstown in the Narragansett

country of Rhode Island. This year, however, at least one male has been heard singing upon the 28th and 29th of June, and the 1st and 2d of July in precisely the same neighborhood where he was heard and seen, as previously recorded. The song this year was a rather faint-hearted imitation of the Cardinal's fine call. By that I mean, that it was not uttered with the boldness observed in previous years. This may have been due to the great heat or some other cause, but there is no question it is the voice of the Great Carolina Wren upon the dates given this year.

I send this note to 'The Auk,' hoping that some other observer may feel prompted to record his observation, as it is certainly a matter of interest to Rhode Islanders to find this delightful bird becoming a fairly regular summer visitor.—R. G. HAZARD, *Peacedale, R. I., July 4, 1907.*

Large Set of Brown-headed Nuthatch's Eggs.—On March 17, 1907, I took a set of eggs that perhaps is worth mentioning. While out riding I saw a Brown-headed Nuthatch (*Sitta pusilla*) fly from a hole in a pine stump (about 6 feet up). Riding up to it I broke a piece of the wood away and peeped in. To my surprise, the nest contained nine eggs. I took the nest and eggs and now have them. Incubation was slight. The eggs are rather under the average in size and very uniformly marked. I have never seen a set of more than six eggs before and have found sets of that number rather rare. The usual set here is five eggs, while often it is four and sometimes only three. The earliest set I have ever taken was a set of six fresh eggs on March 3, while the latest was a set of five slightly incubated on April 22.—I. F. ARNOW, *St. Marys, Ga.*

A Recent Blue-gray Gnatcatcher (*Polioptila caerulea*) in Delaware Co., Pa.—On May 18 while out birding near Wayne, Pa., I was surprised to see a Blue-gray Gnatcatcher above me. I was more than pleased to see it on account of its rareness in this locality and also the first one I had ever seen. I followed and watched it at close range with fairly strong glasses and feel very sure of its identity. The long black tail with white edges and the whole appearance of the bird were unmistakable.—LEONARD S. PEARSON, *Wayne, Pa.*

Two Birds new for Ohio (*Oceanites oceanicus* and *Merula migratoria achrostrera*).—During a recent visit to New Bremen, Anglaize Co., Ohio, Mr. Gus Kuenning, a banker and close observer of birds, told me about the occurrence of Wilson's Petrel at this place. On July 7 of this year, he found the partly decomposed body of a bird, which had been washed off the roof of St. Paul's church by a severe rainstorm. He identified the bird and upon cross-examining him I found that he knew very well what he was talking about and that his identification was correct. How long the body had lain on the roof could not be told and it was also too far gone to be preserved. It was probably killed by striking against the church tower. This is the second species of these wanderers that has been found in the State of Ohio.

In going over my specimens of Ohio Robins I found a female shot April 20, 1900, at Waverly, Ohio, that agrees in coloration with the description of *Merula migratoria achrustera* as given in Vol. IV of Ridgway's 'Birds of North and Middle America.' The measurements are somewhat larger than the type measurements, but the bird certainly is much closer related to *achrustera* than to *migratoria* proper. I do not doubt but what the majority of the southern Ohio Robins belong to the southern variety, as even some of the wintering Robins shot there are not typical *migratoria*.—W. F. HENNINGER, *Tiffin, Ohio*.

Petiver's 'Gazophylacium.'—I recently found in an old book shop a unique copy of Petiver's 'Gazophylacium Naturæ et Artis,' consisting of 100 folio copper plates and 1245 figures of "beasts, birds, fishes, reptiles, insects, shells, plants, corals; as also diverse fossills, formed stones of the sea, with their names, places and short descriptions to each," London, 1702-1709.

With these two volumes of plates was originally published a small volume of text giving a short description of the original of each figure. This last volume seems to have become very scarce for in 1742, a Mr. Roger North of Rougham, after waiting upwards of twenty years, found a copy; then, for his amusement, he transcribed all the descriptions onto a sheet opposite each figure in the plates. Not satisfied with this he gathered five other of Petiver's productions, in all 195 folio plates, and 2726 figures, treating them in the same manner, thus producing 258 folio pages of finely written matter.

Aside from being unique the book is of especial interest to Americans as it contains 92 figures of American animals, birds, insects, etc. Perhaps the most interesting and probably the first cut ever published of the Ruby-throated Hummingbird (*Trochilus colubris* Linn.) is found on Plate 3, Fig. 8. It portrays the back view of a rather well shaped skin and the written description reads "*Tomincio Mariana Virescens Gutturæ flammeo*. The Humming Flame Throat. The Reverend Mr. Hugh Jones sent me this scarce and beautiful bird from Mary-Land."

On Plate 6 is figured the side view of a skin. In a general reference to all the figures on the plate I find: "Here you will see first a mondescript Bird from Mary-Land with a Golden or yellow throat"; then each figure is treated separately and the following occurs, '*Avis Marylandica Gutturæ Luteo*. The Mary-Land yellow throat. This the Reverend Mr. Hugh Jones sent me from Mary-Land." Doubtless church records somewhere will show who this clergyman was who sent bird skins from the Jamestown Exposition region over two hundred years ago; 1696 to 1698 being the years most often mentioned in acknowledging specimens.

Another figure on Plate 43 represents the American Eared Grebe, opposite which he writes: "*Ardea Exotica Aurita*. This Bird is very remarkable for its two eared Tufts on the Head and Wanting its Back Toe. Mr. Ray's Figure of the *Ardea Cinerea minor* in his Ornithology Tab. 49, pag.

279 some what resembles it. I copied this from A picture in Mr. Clark's Collection of Paintings." Some of our modern bird skimmers might get amusement, if not inspiration, from the methods in vogue over two hundred years ago, for in his "Directions for preserving All Animals, viz; Beasts, Birds, Fishes, Serpents, Insects, Shells, Fossills &c. so as to keep" he says: "Thirdly, as to Fowls, those that are large, if we cannot have their Cases whole, their Heads, Legs and Wings will be acceptable: but smaller birds are easily preserved entire, by Opening their Bodies which is best done by cutting them under the Wing, and take out their entrails, and then Shutt them with Oakham or Tow mixt with pitch or Tar and being thoroughly dried in the sun, wrap them up Close & keep them from moisture." I know nothing of Roger North who so laboriously transcribed these works but if he had a monument of marble it is not better preserved than this one of paper and nut-gall ink.—FRANK S. DAGGETT, *Oak Park, Ill.*

Supplemental Note to 'A Lapland Longspur Tragedy.'¹—Mr. A. D. Brown of Pipestone, Pipestone Co., in replying to the letter of inquiry sent to him said that twice before in his experience in southwestern Minnesota, extending over a period of twenty-five years, there had been similar considerable destructions of Lapland Longspurs occurring in the spring of the year under like climatic conditions. One of these he describes in some detail as he observed it at Pipestone. A sleet had fallen which froze as it fell, covering the earth with a layer of ice on which three inches of soft wet snow fell. That night the migrating Longspurs entered this ice and snow covered area, many of them hungry and weary, and being unable to procure food finally fell from exhaustion and were either killed by injuries received in striking various objects or remained fluttering about on the ground until the sun rapidly melted the snow and ice the next morning, thus uncovering the fallen seed supply, from which they secured sufficient food to restore their strength and permit them to continue on their way. By afternoon all these birds were gone. Mr. Brown thinks this failure of the food supply the correct explanation of the phenomenon, because when the live birds were picked up that night they fed greedily from seeds provided and quickly gained sufficient strength to fly away. Also the stomachs of many dead birds examined were empty although the bodies were fat. During the early winter, when the Longspurs are abundant, the snow is dry and blows off the ridges and fields, and then, too, the weed tops projecting above the snow still contain many seeds which are later shaken out by the high winds. During the wet snowfalls of early spring, conditions are quite different and the ground-feeding seed-eaters occasionally find their food supply suddenly withdrawn over wide areas. There was no snow at Pipestone at the time of the last destruction and although the Longspurs were present in great numbers none perished at

¹ Published in this number of 'The Auk', pp. 369-377. This note was received from the author too late to be added as a footnote at the end of the article.—EDD.

that place. This theory of Mr. Brown's of rapid exhaustion from sudden withdrawal of food seems worthy of consideration and may seem, in part at least, to explain these rather mysterious occurrences.—THOMAS S. ROBERTS, *Minneapolis, Minn.*

RECENT LITERATURE.

Ridgway's 'The Birds of North and Middle America,' Part IV.¹—Part IV of this great work, issued in July of the present year, marks the completion of the first half, carrying the subject through the Oscines and including the first four families of the Mesomyodi. The first four Parts contains, as stated in the Preface, "1,675 species and subspecies, or somewhat more than half the total number of North and Middle American Birds."²

The present volume includes ten families, as follows: Turdidæ, with 12 genera, 54 species and 43 additional subspecies; Zeledoniidæ, monotypic (included in the Turdidæ in the main text and raised to family rank in the addenda, p. 885); Mimidæ, 12 genera, 33 species and 17 additional subspecies; Sturnidæ, including the common Starling, introduced from Europe; Ploceidæ, 2 genera and 2 species, introduced into Porto Rica from Africa; Alaudidæ, 2 genera,—*Alauda*, of casual occurrence in Greenland and the Bermudas, and *Otocoris*, with one species and 25 subspecies; Oxyruncidæ, monotypic; Tyrannidæ, 47 genera, 133 species and 39 additional subspecies; Pipridæ, 7 genera, 15 species and 2 additional subspecies; Cotingidæ, 18 genera, 32 species and 18 additional subspecies. In addition to the 103 genera and 417 species and subspecies formally treated, nearly half as many more are included in the keys and footnotes, so that in many cases nearly all the extralimital South American species of the included genera are passed in review.

Most of the innovations in classification were first made in a special

¹ The Birds of | North and Middle American: | A Descriptive Catalogue | of the | Higher Groups, Genera, Species, and Subspecies of Birds | known to occur in North America, from the | Arctic Lands to the Isthmus of Panama, | the West Indies and other Islands | of the Caribbean Sea, and the | Galapagos Archipelago. | By | Robert Ridgway | Curator, Division of Birds. | — | Part IV. |

Family Turdidæ — Thrushes.

Family Alaudidæ — Larks. |

Family Zeledoniidæ — Wren-Thrushes.

Family Oxyruncidæ — Sharp-bills. |

Family Mimidæ — Mockingbirds.

Family Tyrannidæ — Tyrant Flycatchers.

Family Sturnidæ — Starlings.

Family Pipridæ — Manakins. |

Family Ploceidæ — Weaver Birds.

Family Cotingidæ — Cotingas. | — |

Washington: | Government Printing Office. | 1907. = Bulletin of the United States National Museum, No. 50, Part IV. — 8vo, pp. i-xxii + 1-973, pll. i-xxxiv.

²For notices of previous Parts in this Journal, see Vol. XIX, Jan. 1902, pp. 97-102; Part II, Vol. XX, Jan. 1903, pp. 73-76; Part III, Vol. XXII, April, 1905, pp. 219-222.

paper published in January, 1906,¹ but a few further changes are here made, especially in nomenclature, where *Myiochanes* replaces *Contopus* and *Procnias* supplants the familiar name *Casmorinchos* (or *Chasmorhynchus*, as usually written), etc., and original spellings of many names replace the emended forms of purists. *Planesticus* takes the place of *Merula*, but *Galeoscoptes* remains. The departures from the A. O. U. Check-List names of North American birds are, however, few, and have mostly already been adopted by the A. O. U. Committee, though not yet announced.

The present volume is marked by the same painstaking bibliographic research and attention to details that so eminently characterize its predecessors in the series, and we welcome it with the same sense of gratitude to the author for his invaluable contribution to systematic and faunistic ornithology. The thirty-odd plates of structural details, drawn mostly by J. H. Hendley of Washington, are an important adjunct to the text.—J. A. A.

Townsend and Allen's 'Birds of Labrador.'—This important summary² of present knowledge of the birds of Labrador is based, the authors inform us, on examinations of all the literature on the subject they have been able to find, and on a visit by them to the Labrador coast in the summer of 1906. The paper includes an account of the topography of Labrador, its faunal areas and bird migration; its ornithological history and the bird and egg destruction that have disgraced its coast and inlands, followed by an annotated list of its birds, and a bibliography. The historical part begins with George Cartwright's 'Journal,' published in 1792, and mentions in more or less detail the visits of other naturalists down to the 'Neptune' expedition of 1903–1904, including the journeys of Audubon (1833), Storer (1849), Bryant (1860), Coues (1860), Verrill (1861), Packard (1860 and 1864), Stearns (1875, 1880, 1882), Turner (1882–1884), and others, some of whom barely touched its southern coast. After recounting the barbarous havoc of the 'egggers' and the wholesale slaughter of geese and other waterfowl for their flesh or feathers, it is asked "What will be the result of all this if nothing be done to stop the destruction?" The answer is obvious,—the entire depopulation of the water bird resorts of the Labrador coast and adjacent islands.

In the systematic list 259 species and subspecies are considered, of which two are extinct, and 44 are regarded as having been wrongly attributed to Labrador, leaving 213 as authenticated Labrador species. A tabular statement gives the approximate number of birds seen by the authors in

¹ Some Observations concerning the American Families of Oligomyodidae Passeres. By Robert Ridgway. Proc. Biol. Soc. Wash., XIX, pp. 7–16, Jan. 1906.

² Birds of Labrador. By Charles W. Townsend, M. D., and Glover M. Allen. Proc. Boston Soc. Nat. Hist., Vol. XXXIII, No. 7, pp. 277–428, pl. xxix (map). July, 1907.

Labrador, July 10 to August 3, 1906, with localities and date of observations, the list numbering about sixty species.

The Labrador of the present paper includes the whole peninsula commonly known by that name, extending from the Gulf of St. Lawrence to Hudson Strait, its eastern coast extending from N. Lat. 52° to about 63°. Faunally it extends from the Arctic barren grounds, which wholly occupy its northern part and a narrow strip along the entire eastern coast, across the Hudsonian and into the Canadian zone, the latter extending, in a general way, to "the latitude of Hamilton Inlet." The characteristic species of both plants and birds are enumerated for each of the three zones.

Among the points of special ornithological interest are the notes on the Great Auk, the Labrador Duck and the Eskimo Curlew, and on various species wrongly attributed to Labrador. *Otocoris alpestris praticolor* is eliminated as a bird of Labrador, "the Horned Lark of the Labrador coast, both eastern and southern," being considered as "the northern race, *Otocoris alpestris alpestris*"; and in this connection the alleged recent eastward extension of *praticola* is again considered as probable. The supposed Labrador race of the Savanna Sparrow (*Passerculus sandwichensis labradorius* Howe) is again shown to be untenable, even Mr. Oberholser, contrary to his "previous suspicions," being unable to find "any substantial difference worth recognizing by name." The determination of the status of the Labrador Horned Lark and Savanna Sparrow was among the incentives that induced the authors to undertake the Labrador trip. Altogether the paper that has resulted is one of unusual interest and value, clarifying and summarizing our knowledge of Labrador ornithology.—J. A. A.

Townsend's 'Along the Labrador Coast.'¹—This is an entertaining narrative of the trip along the Labrador coast that furnished the basis of Townsend and Allen's 'Birds of Labrador,' described above. It consists, as would be expected, mainly of notes on the natural history, and especially on the birds of the Labrador coast, but contains as well an interesting account of the country, its industries and people. The narrative is pleasantly written, and as little worth noting appears to have escaped the author's attention it is full of general as well as ornithological information about the parts of the country visited. The author's ornithological observations are here recorded in much greater fulness and much more informally than in the 'Birds of Labrador,' and have thus the freshness of the daily note-book jottings of the bird-lover in fresh fields. An index, which gives the technical as well as the common name of the species observed, gives definiteness as well as easy access to the natural history matter of the text.

¹ Along the | Labrador | Coast | — | By | Charles Wendell Townsend, M. D. | Author of "The Birds of Essex County" | With illustrations from Photographs | and a map [Seal] — | Boston Dana Estes & Company Publishers [1907] (no date). Price, \$1.50.

'Along the Labrador Coast' is thus an entertaining and instructive narrative of much literary merit.—J. A. A.

Clark on New Birds from Eastern Asia and the Aleutian Islands.¹— This paper, the author states, is based mainly on a collection of birds made by the late Mr. P. L. Jouy during a residence of over three years in Korea. This collection, containing 554 specimens, was being worked up by Mr. Jouy at the time of his death in 1894, but his report was never completed, and there have been as yet only incidental reference to a few of the species. The new forms here described have come to light through the preparation by Dr. Clark of a report on the ornithological results of the recent cruise of the United States Fisheries steamer 'Albatross,' during which he has been permitted to make use of the Jouy and other pertinent material in the National Museum.

The 18 new species and subspecies here characterized include a new ptarmigan (*Lagopus rupestris chamberlaini*) from Adak Island, Aleutian Islands, collected by Mr. C. H. Townsend in 1893. It is described as "the grayest and one of the lightest" of the local forms of ptarmigan of the Aleutian chain. The new forms are mostly from Korea, but include five or six from Japan. A new genus, *Tisa*, is proposed for *Emberiza variabilis* Temminck, which has heretofore been referred to various genera by different authors.—J. A. A.

Blackwelder's Notes on Chinese Zoölogy— In this Report² the birds occupy pp. 483–506, and is based on a collection of 64 specimens, representing 49 species, "supplemented by descriptions of 81 additional species, individuals of which were examined in the hand or seen at short range and described at the time of observation. Regarding some of the latter there is necessarily more or less doubt." The identification of the specimens is accredited to Dr. Charles W. Richmond; and the single new form (*Olbiorchilus fumigatus idius* Richmond) rests on his inedited description. Of the 132 species recorded about twenty are entered as doubtfully determined and more than half of the others rest on field determinations of birds seen in life. Colored plates of six species, drawn by Mr. J. L. Ridgway, illustrate the report on the birds. The region traversed includes portions of the Provinces of Chi-li, Shan-tung, Lian-tung, Shan-si and Shen-si.—J. A. A.

Bangs on Birds from Costa Rica and Chiriqui.³— This paper is based on

¹ Eighteen new Species and one new Genus of Birds from Eastern Asia and the Aleutian Islands. By Austin H. Clark, of the United States Bureau of Fisheries. Proc. U. S. Nat. Mus., Vol. XXXII, pp. 467–475. Published June 15, 1907.

² Research in China. Expedition of 1903–04, under the Direction of Bailey Willis. Report on Zoölogy, by Eliot Blackwelder. Extracted from Carnegie Institution of Washington Publication No. 54, Research in China, Vol. I, Part II, pp. 481–508, pll. col. lviii–lxiii. Published June, 1907.

³ Notes on Birds from Costa Rica and Chiriqui, with descriptions of new forms and new records for Costa Rica. By Outram Bangs. Proc. Biol. Soc. Washington, Vol. XIX, pp. 101–112. Published July 30, 1907.

Mr. C. F. Underwood's collection, consisting "of 3,365 skins, representing about 611 species and subspecies," recently purchased by Mr. John E. Thayer of Lancaster, Mass. The collection contains many specimens identified by the late Osbert Salvin, and is rich in young birds in nestling plumage. "The dates on the labels cover nearly a score of years and the collection is the result of Underwood's laying aside the better things secured by him during this period." It is thus fortunate that this important collection was secured by Mr. Thayer in the interest of American ornithologists.

Besides the new records for Costa Rica and the critical comment on various species, eight species and subspecies are described as new. In his remarks on the various forms of *Stelgidopteryx*, Mr. Bangs emphatically reaffirms his "belief that there is *but one* species of *Stelgidopteryx*."—J. A. A.

Clarke 'On the Birds of the Weddell and adjacent Seas.'—In his third paper on the 'Ornithological Results of the Scottish National Antarctic Expedition' Mr. Clarke¹ deals with the bird-life of the Antarctic Ocean southward of the 60th parallel of south latitude, or of the Weddell Sea and adjacent waters. Following an itinerary of the 'Scotia' in these high southern waters, is a summary of the leading ornithological observations, in which it is stated that four species of birds were added to the short list of nine previously known to have occurred south of the Arctic Circle, these additions including the Arctic Tern (*Sterna macrura* = *paradisæa*). "A specially important ornithological feature of these voyages of the 'Scotia,' says Mr. Clarke, "was the presence in the Polar Sea of a number of species of Petrels far beyond the southern limits of their breeding areas. This seems to indicate that at the close of the southern summer numbers of Hutton's Sooty Albatroses (*Phæbæria cornicoides*), Cape Petrels (*Daption capensis*), Giant Petrels (*Ossifraga gigantea*), Antarctic Petrels (*Thalassæa antarctica*), Giant Silver Petrels (*Priocella glacialis*), Blue Petrels (*Halobæna carula*), and *Æstrelata brevirostris* cross the Antarctic Circle and sojourn among the polar ice ere they retreat northwards to pass the winter in more genial oceanic resorts. It is possible, however, that some of these visitors to the far south are non-breeding birds, and, if so, they may have spent the entire summer there. The Tubinares are, as is well known, great wanderers, but these very remarkable southern incursions are, perhaps, to be explained by the extraordinary abundance of food to be found in the waters of the far south in the summer and autumn, which allures some of the birds further and further towards the pole, until the ice-barrier, which almost girdles the Antarctic Continent, arrests further progress, since at its base the food-supply entirely ceases. This, too,

¹ Ornithological Results of the Scottish National Antarctic Expedition.—III. On the Birds of the Weddell and adjacent Seas, Antarctic Ocean. By Wm. Eagle Clarke, F. R. S. E., F. L. S., The Royal Scottish Museum. Ibis, April, 1907, pp. 325-349, and map.

explains why our familiar Arctic Tern (*Sterna macrura*) passes the southern summer (our northern winter) amid these ever-icy seas."

The systematic list numbers 17 species, with extended comment on their distribution and habits. The only Tern previously recorded from this region is the well-known South American *Sterna hirundinacca*. But "when the 'Scotia' sailed from the South Orkneys she left the *Sterna hirundinacca* behind her. Other Terns were met with, often in considerable numbers, and specimens were fortunately obtained in widely scattered portions of the Weddell Sea. These, strange to say, I found to belong to the most northern representative of their genus, namely, to *Sterna macrura*, the Arctic Tern! Thus this familiar bird to British ornithologists would seem to have the most extensive latitudinal range to be found among vertebrate animals, since it is now known to occur from 82° N. to 74° 1' S. . . . They were often observed in considerable numbers, and are logged for March 5th, 1904, as being seen in thousands in 72° 31' S.; while from the 9th to the 13th of the same month, many were seen when off Coats Land, in 74° 1' S., 20° 0' W., . . . That it is only a winter visitor does not admit of doubt, for the bird certainly does not breed there; nor is any other Tern, so far as we know, a native of the Antarctic Continent." As is now well-known, somewhat reversed conditions occur in the case of the Wilson's Petrel (*Oceanites oceanicus*), which breeds in the Antarctic islands and wanders north in the northern summer to the North Atlantic.—J. A. A.

Goeldi's 'Album de Aves Amazonicas.'—Fasciculus III (pll. xxiv–xlvi) brings to a close this noteworthy supplement¹ of 48 colored plates, illustrating Dr. Goeldi's well-known 'Aves do Brazil,' published 1894–1900 (2 vols. 12mo). About 400 species are very successfully illustrated, by the tricolor process, for the most part with excellent results. They thus form a most desirable and valuable supplement to the text, from the point of view of not only the general reader, but the student of South American ornithology. We tender the author our sincere congratulations on the results thus so happily achieved.

Dr. Goeldi, after twenty years' residence in the American tropics, has retired from the active directorship of the great museum which so appropriately bears his name, it being mainly his own creation, returning to Switzerland, his native land, still in vigorous health, with, we trust, many years of scientific activity before him.—J. A. A.

¹ Museu Goeldi | (Museu Paraense) | de Historia Natural e Ethnographia | — | Album de Aves Amazonicas | organizado pelo Professor | Dr. Emilio A. Goeldi. | Director do mesmo Museu | — | Publicação iniciada por ordem de S. Ex^{cia} O S^{nr} Dr José Paes de Carvalho, | ex-governador | e continuada sob o Governo de S. Ex^{cia} O S^{nr} Dr Augusto Montenegro | — | Desenhos do S^{nr}. Ernesto Lohse, Desenhista-Lithographo do Museu Goeldi | — | Supplemento illustrativo a' obra "Aves do Brazil" | pelo Dr. Emilio A. Goeldi | Livraria classica de Alves & Cie, Rio de Janeiro, | 1894–1900 (2 volumes) | 1900–1906, — 4to, fasc. I, 1900, pll. 1–12; fasc. 2, 1902, pll. 13–24; fasc. 3, 1906, pll. 24–48. With title-page, contents, indexes, and directions for binding. Also excerpts (8 pp. 4to) from reviews and personal acknowledgments, etc.

Mrs. Davenport's 'Birds of Windham and Bennington Counties, Vermont.'—These two counties embrace the southern fourth of the State of Vermont, and aggregate an area of about forty miles square, varying in elevation from about 200 feet in the valley of the Connecticut River, which forms its eastern border, to nearly 4000 feet, in the interior. This region has been Mrs. Davenport's home for the greater part of her life, and she has become familiar with its flora and fauna through many years of careful exploration. The character of the country is first described, followed by an annotated list of the birds, numbering 176 species. The annotations contain much definite information about the manner of occurrence of the species. Of the twelve species of *Dendroica* recorded eight are given as more or less common breeding summer residents. Unfortunately the list is badly disfigured by typographical errors, for which the author is doubtless not responsible.—J. A. A.

Herman's The Protection of Birds in Hungary.²—Hungary—greatly to her credit—has ever taken a most active interest in bird protection, and from the first inception of the movement in Europe for the international protection of birds has been one of its strongest supporters. This work, issued in English, by order of the Hungarian Minister of Agriculture, and prepared by Otto Herman, the well-known Hungarian ornithologist and director of the Hungarian Central Bureau for Ornithology, is, in effect, an historical account of the efforts for bird protection in Europe, and of the present state of international bird protection. Preceding the historical part is an introduction (pp. 9–23) treating of the generalities of the subject, under 'Birds and Nature' and 'Birds and Man.' The 'Historical Part' begins with a general statement respecting the changes unfavorable to bird-life due to the spread of agriculture, and the resultant need for systematic bird protection through legal enactments and international coöperation. Then follows a detailed account of the progress of bird protection in Europe, beginning with a meeting of German farmers and foresters in 1868 in advocacy of an international agreement, and of subsequent steps to the same end down to the International Convention for the Protection of Birds held in Paris in 1902, and the adoption, in 1906, of the 'International Convention for the Protection of Birds,' into the "Corpus Juris" of Hungary; which, "being endowed with the force of law, found the rational protection of birds in Hungary a *fait accompli*." The signatories to the Paris Convention (March 19, 1902) include, through their properly appointed representatives, the following countries: Austria, Prussia, Belgium, Spain,

¹ Birds of Windham and Bennington Counties. By Mrs. Elizabeth B. Davenport. Vermont Bird Club, Bulletin No. 2, pp. 5–14, July, 1907.

² Publication of the Royal Hungarian Minister of Agriculture |—| The International | Convention | for | The Protection of Birds | concluded in 1902; | and | Hungary. | Historical Sketch. | Written by order of his Exc. | Ignatius de Darágyi, | Hungarian Minister of Agriculture. | By | Otto Herman | late M. P. | Director of the Hung. Centr. Bur. f. Ornithology. | [Seal] Budapest | Victor Hornyánszky, Court Printer | 1907 — Svo, pp. v + 241.

France, Greece, Luxemburg, Monaco, Portugal, Sweden and Norway, and Switzerland. Great Britain is not in the list, but is, independently of the Convention, a strong supporter of bird protection. Italy, however, refused to sign; and not only this, legally sanctions and encourages the wholesale slaughter of the birds, even on their migrations, which all the other countries of Europe so strenuously protect!

The Paris 'Convention' consisting of 16 articles and two schedules (schedule I, useful birds; schedule II, noxious birds), is here published in full. It provides protection for all of the useful birds, their nests and eggs, and prohibits the use of traps, cages, nets, nooses, lime-twigs, and any other kind of instruments used for the purpose of rendering easy the wholesale capture or destruction of birds. Destruction of game by firearms is allowed during prescribed open seasons. During the close season for any kind of game bird it is unlawful to import, sell, or offer to sell, or transport or deliver any such birds. With this we may contrast the position of Italy, which instructed her delegate to sign no "binding schedule," and added that "no agreement refused by Italy could be of any advantage to Hungary or Austria"—a fine dog-in-the-manger spirit, quite in keeping with her approval of the brutal wholesale destruction of the most useful insectivorous birds, as well as all others, that visit this country in winter on migration, "and are therefore alien property as far as Italy is concerned."

'The Protection of Birds in Hungary' occupies pp. 145-175, and includes the bird protection act now in force in that country. Not only is the protection of birds rigidly insured, but the Hungarian Ministry of Commerce issued on June 12, 1906, an order for artificial nesting-boxes to be placed in the State forests, comprising five million acres; and also, at the same time, issued a decree providing for bird-days and tree-days in the scheme of work of elementary schools. As early as 1898-99 the Minister of Agriculture caused to be published (in Hungarian) a large work (in two volumes) by Stephen Chernel on economic ornithology, and in 1900 ordered its translation into French, in order to make it accessible to the people of other nationalities, following this in 1901 with a smaller work, by Otto Herman, with illustrations by T. Csörgey, on 'Useful and Noxious Birds,' prepared with special reference to reaching the lower classes as an appeal in behalf of the birds.—J. A. A.

Williams's 'Game Commissions and Wardens.'¹—This is a digest of provisions for the enforcement of game laws, and comprises three parts. "Part I contains a historical summary of the evolution of the warden service and general discussion of various features connected with warden work; Part II, a summary of the most important provisions of the laws stated in the briefest possible form and arranged in uniform sequence; Part III, extracts

¹ Game Commissions and Wardens, their Appointment, Powers, and Duties. By R. W. Williams, Jr., Game Law Assistant, Biological Survey, U. S. Department of Agriculture, Biological Survey—Bulletin No. 28, 8vo, pp. 1-285, with maps and diagrams. Issued August 1, 1907.

from the statutes relating to game warden departments, duties and powers of officers, and special provisions connected with administration. No effort has been spared to make the report as complete and accurate as possible. In addition to extracts from the statutes, it contains the results of seven years' observation of the methods of administering game laws, and the conclusions of those who have contributed to the discussion of points of special interest." The foregoing is from the Preface (p. 10), by Dr. T. S. Palmer, and states concisely the scope and purpose of this important publication, which must be of great value to persons interested in game protection, and especially to those charged with the enforcement of game laws. Under 'Game law administration' (pp. 43-99) are defined the powers of officers and methods of procedure in respect to arrest, search and seizure; prosecutions, in reference to who may prosecute, the methods, and the results, etc. The 'Summaries of the provisions relating to enforcements' give, in concise form, the provisions at present in force in all of the States and Territories, and include the duties of officers, and the offenses and the required evidence on which to base prosecutions. The 'Extracts from laws with special reference to enforcement' occupies the second half of the 'Bulletin,' and presumably comprise all of the essential features. We have thus in convenient form a condensed 'law-book' on game protection which should meet an actual need.—J. A. A.

Anderson's 'The Birds of Iowa.'—In a paper¹ of nearly 300 pages, Mr. Anderson records 355 species and subspecies as of known occurrence in the State, 309 of which are "found more or less regularly," and 44 as only "casual or accidental" visitants; one species, the Carolina Paroquet, is given as extinct, and another, the House Sparrow, as the only introduced species. Twenty-five additional species are given in a 'Hypothetical List' as having been taken "very close to the borders of Iowa," or "reported as occurring in Iowa on what appears to be insufficient evidence." Some of these might well have been included in the main list, and it is only a question of time when all may doubtless be added on the basis of actual capture within the State; but their present exclusion as Iowa birds is commendable.

An 'Introduction' of 20 pages states the scope and basis of the work, the topographic, climatic, and faunal features of the State, and contains a list of the large number of contributors who have furnished valuable notes or local lists, covering most of the counties of the State.

The method of treatment includes, usually, a general statement regarding the character of the bird's occurrence in the State, followed generally by a paragraph of detailed county records, especially in the case of the rarer species, giving locality, date and authority for the records cited. A large part of the text thus consists of previously unpublished records, and

¹ The Birds of Iowa. By Rudolph M. Anderson. Proc. Davenport Acad. Sci., Vol. XI, pp. 125-417, March, 1907.

adds greatly to our knowledge of the distribution of many species of birds within the boundaries of Iowa. The list is thus voluminously annotated, the notes varying, as the case may require, from a dozen lines to a page or two to the species. It is, however, all pertinent matter, and the list as a whole is an unusually important contribution to faunistic ornithology.

A bibliography of 10 pages consists of the titles of, for the most part, general works that include incidental references to Iowa birds; but as they are unannotated, and as the minor records and 'notes' contained in ornithological and other periodicals are altogether omitted, it falls far short of being a satisfactory bibliography of the subject treated. Reference is here made to 'The Literature of Iowa Birds. A Complete Record of the Published Writings on the Birds of Iowa,' by Paul Bartsch, "prepared [in 1899] as a thesis for the degree of Master of Science," and forming three volumes of typewritten manuscript, deposited in the library of the State University of Iowa. It is to be hoped that Dr. Bartsch's work may eventually be published, at least in extended abstract, and thus be made available for more general use.—J. A. A.

Rich's 'Feathered Game of the Northeast.'¹ — This handsomely printed and effectively illustrated book of about 450 pages treats of about ninety species of the game birds of the "upper eastern coast" of North America, from the standpoint of the sportsman, by a sportsman, well qualified for the task by personal experience in the field and literary and artistic ability. It should prove of interest not only to sportsmen but to the general reader, and to some extent to ornithologists. The writer has evidently some knowledge of ornithology, the technical names of the birds being 'up to date,' and their relationships and distribution, when referred to, are generally correctly stated, although his surmise that "possibly a few" Heath Hens may still "be left on the eastern end of Long Island" is a little out of date. The author is heartily in favor of better protection for our rapidly decreasing game birds, and in his preface and throughout his book urges "upon the great brotherhood of sportsmen" moderation in the use of the gun, and both in the preface and elsewhere (see under American Woodcock, p. 127) favors the abolition of spring shooting, the prohibition of the sale of game, and the limitation of the number of birds which a man may kill in a day's hunt. The illustrations, from drawings by the author, are a serviceable addition to the text, being for the most part good representations of the birds depicted.—J. A. A.

¹ Feathered Game of the Northeast | By | Walter H. Rich | With illustrations by the author | New York | Thomas Y. Crowell & Co. | Publishers.— No date (1907). Svo, pp. xvi + 432, frontispiece in color (Wood Duck), and 84 halftone plates. \$3.00 net, postage 30 cents extra.

CORRESPONDENCE.

Protective Coloration.

EDITORS OF 'THE AUK':—

Dear Sirs:—I wish to record in 'The Auk' the main results, up to date, of my study of Protective Coloration. These were all foreshadowed in my first article in 'The Auk' (XIII, 1896, pp. 124–129, 10 illustr.), and, later, in a paper published in the Transactions of the Entomological Society of London,¹ I was able to present the subject of patterns in a much more developed shape. What I now wish to record is mainly what I communicated to the annual meeting of the A. O. U. in 1904, but which the reporters failed to get, so that it remains, as yet, unpublished. It is this: It now proves to be the case that all patterns and colors, upon all animals whatsoever, except such as live in the dark, or are neither predatory nor preyed upon, are, *when seen against the background against which their enemy (or prey) would see them at the critical moment*, in expressibly perfect pictures of this background, and therefore obliteratively colored. The marvellous perfection of the scene thus painted on each animal is, of course, only appreciable by painters. It is such that the different parts of any resplendent bird's costume, peacock, wood duck, or blue jay, make, when separated, and merely slightly rearranged, a scene of their habitat that defies, in its realism, all painters.

The one thing that has kept even artists from beginning to see this fact is that no one has perceived that oblitative coloration means *matching a certain background*, not a general resemblance to surroundings. This old phrase means actually nothing. For instance, a white heron and a brown frog may be in the *same surroundings*, yet the heron sees the brown frog against brown mud, while the frog sees the white heron against the *sky!*—the nearest match possible, and one which effaces the heron's tell-tale upper contours, especially when the sky is white, or at night. Till now, however, observers have regarded the frog and heron, and discussed them, from *men's* standpoint, and called *one* protectively colored, and one conspicuous. This principle is universal in nature.

My son and I are now sending to the press a book demonstrating my results up to now. Fortunately it *involves no theory* whatever, but is all shown to be susceptible of absolute ocular proof. It does not *say* that patterns and countershading *exist to conceal animals*, but shows that they do always conceal them.

ABBOTT H. THAYER.

¹ Protective Coloration in its Relation to Mimicry, Common Warning Colors, and Sexual Selection. Trans. Entomol. Soc. of London, 1903, Part IV, pp. 553–569. Dec., 1903.

NOTES AND NEWS.

DR. WILLIAM LAGRANGE RALPH, a Member of the American Ornithological Union, died in Washington, D. C., on July 8, 1907, of a complication of organic heart and kidney lesions in the fifty-seventh year of his age. He leaves a widow, an adopted daughter, Katharine Louise, and two brothers, G. Fred Ralph and Henry Ralph. He was born in Holland Patent, N. Y., June 19, 1851, and remained there until 1863 when he moved with his parents to Utica. In the dozen years of early life spent among the fields and woods of his native home and surrounded on all sides by a rich and ever varying assortment of bird life, the seed of his future love for ornithology was sown and gradually ripened as time went on. He often spent the greater part of his vacations and holidays at Holland Patent with his grandfather, who, as an ardent sportsman and in a general way an interested observer of all birds, encouraged the boy by precept and example to look for the many secrets which Nature held in store for him. Here he began to watch the birds construct their nests and to levy an occasional egg from them to add to his rudimentary collection.

He received his preliminary education from the schools of Utica and Whitestone Seminary, and in 1879 completed his studies and secured his medical degree at the college of Physicians and Surgeons, Columbia University, New York City. Later in the same year he began to practice his profession in Utica, but owing to delicate health resulting from a weakened heart he gave up this exacting work and returned to a more quiet life. He evidently was glad of the opportunity to renew his research in ornithology which had been held somewhat in abeyance during his college life. Fortunately, being of independent means, he was able to devote unlimited time to study and to field work, which primarily was carried on among the rarer and more interesting birds of Oneida County and later was extended to much broader fields. Within a comparatively short time, through his own efforts and those of trained collectors, and by purchase, the foundation of a collection of eggs was formed which subsequently became one of the most valuable private collections in the country. During the summer much of his time was spent with the birds in the Northern woods, while in winter and spring the marshes and forests of Florida were explored in search of interesting nests and eggs.

When Major Bendire planned to write the 'Life Histories of North American Birds' he was well equipped, so far as western birds were concerned, but was sorely in need of reliable detailed information regarding the nesting habits of some of the rarer eastern species. This data in part, Doctor Ralph was able to furnish and in many places pages of almost literal quotation from his field notes may be found in this most valuable standard work. Major Bendire acknowledged in his introduction indebtedness for this material assistance.

Although Doctor Ralph gathered full notes and frequently was quoted

by others, so far as we know his only published papers were 'An Annotated List of the Birds of Oneida County, N. Y. and the Immediate Vicinity,' which was issued under joint authorship with Mr. Egbert Bagge of Utica, in 1886, and an addendum to this list published in 'The Auk' in 1890 (pp. 229-232).

After the death of Major Bendire in 1897 Doctor Ralph was made custodian of the egg collection of the National Museum, and in 1901 his title was changed to that of curator. From the very first when he began to associate with Major Bendire he took a deep interest in the Museum collection and from time to time made valuable donations of beautifully prepared and carefully identified eggs, aggregating upwards of 10,000 specimens. He also went to considerable trouble and expense in collecting mammals and other desiderata for the Museum, and on one occasion purchased a fine example of the extinct Philip Island parrot which was in danger of being sent abroad. He always was fond of studying the habits of wild creatures and of keeping them as pets. During the past few years he purchased and liberated in the Smithsonian grounds many gray squirrels for the purpose of giving pleasure to visitors and a show of wild life to this attractive spot. It was a familiar sight during cold wintry weather to see the Doctor hunting up his pets to furnish them with a liberal and needed supply of nuts or other food. A few days before his death, while in a very weakened condition, with great effort he went to his office, it is thought for the main purpose of seeing whether his pets there had had proper attention.

Although in delicate health Doctor Ralph seemed to look upon the bright side of life and was happiest when associating with or entertaining his chosen friends. He never tired talking over collecting or hunting experiences, and was most enthusiastic while listening to or giving details of some important capture or successful day in the field. He was unselfish, kind hearted and generous almost to a fault, and we feel that in his death the Union has lost a valuable member and his associates a devoted friend.—
A. K. F.

THE SEVENTH INTERNATIONAL CONGRESS OF ZOÖLOGY held a six days' session (August 19-24, 1907), in Boston, putting into effect without material change the program announced in the first preliminary circular of the Executive Committee issued in 1906 (see Auk, XXIII, Oct. 1907, p. 486). There was a large attendance of foreign delegates and members, and the zoölogists of America were well represented, the registered attendance being about five hundred. The general meetings were held in Jordan Hall, New England Conservatory of Music, and the sectional meetings in the new buildings of the Harvard Medical School. President, and Chairman of the General Committee of the American Society of Zoölogists, Alexander Agassiz; General Secretary of the Permanent Committee of the International Zoölogical Congress, R. Blanchard, Paris; Secretary of the Congress, Samuel Henshaw. The arrangements for the work of the Congress

and for its entertainment were elaborate, and the weather was exceptionally favorable. On Monday evening a reception was tendered by the Local Committee at the Art Museum, through the courtesy of the Trustees; on Wednesday evening a reception was given by the President at the Hotel Somerset. The mornings were occupied with the sectional meetings, the general sessions being held in the afternoons, at which the business of the Congress was transacted, followed by addresses, including the address of the President, and addresses by distinguished delegates on subjects of wide interest. The week closed with an excursion on Saturday to Harvard University.

The Congress organized in ten Sections, as follows: I, Animal Behavior; II, Comparative Anatomy; III, Comparative Physiology; IV, Cytology and Heredity; V, Embryology and Experimental Zoölogy; VI, Entomology and Applied Zoölogy; VII, General Zoölogy; VIII, Palæozoölogy; IX, Systematic Zoölogy; X, Zoögeography and Thalassogeography. The names of these sections indicate how greatly changed has become the lines of zoölogical research during a single generation; of the 300 or more papers and addresses entered on the program, less than one third were listed under sections VII-IX. The attempt to organize a section of Ornithology (see Auk, XXIV, April, 1907, p. 239) failed through lack of response on the part of ornithologists, who, both abroad and at home, seemed to take little interest in the Congress. The eleven titles on the program relating to ornithology are: in Section I, J. P. Porter, A Comparative Study of Birds with respect to Intelligence and Imitation; J. E. Duerden, The Influence of Domestication on the Behavior of the Ostrich; F. H. Herrick, Organization of the Gull Community, a Study of the Communal Life of Birds. In Section II, W. A. Loey, The Fifth and Sixth Aortic Arches in Birds and Mammals. In Section IV, C. B. Davenport, Reversion in Poultry. In Section V, M. Blount, On the Cleavage and Formation of the Periblast and the Germ Wall in Pigeons; J. T. Patterson, On Gastrulation in Birds. In Section VII, S. A. Forbes, A Statistical Study of the Local Distribution and Ecology of Birds; C. W. Beebe, Geographic Variation in Birds, with special reference to Humidity. In Section VIII, C. H. Sternberg, *Hesperornis regalis*, the Royal Bird of the West. In Section X, F. M. Chapman, Remarks on the Geographical Origin of North American Birds. About sixty entries of "demonstrations, exhibits, etc.," were on exhibition during the Congress, including instruments, and apparatus, models, drawings, books, and preparations, illustrating special lines of research.

The Report of the International Commission on Nomenclature was unanimously adopted at the general session held on Friday, and is of general interest to systematic zoölogists. In addition to several recommendations in amplification of Articles 8, 14, 20 and 29, and several general rulings, covering 'The nature of a systematic name,' 'The status of publications dated 1758,' 'The status of certain names published as manuscript names,' and 'The status of certain pre-Linnæan names reprinted subse-

quent to 1757,' Article 30 of the International Code of Zoölogical Nomenclature, as adopted at the Berne Congress in 1904, was cancelled and a new Article 30 adopted in its place. Article 30 provides for the determination of types of originally typeless genera. The new Article 30 includes practically all of the provisions of the old Article 30, amplified and made more explicit, especially in respect to 'types by subsequent designation,' or types by designation of a first reviser, and also by incorporating most of the rules and recommendations published by Dr. Charles Wardell Stiles, U. S. A., in September, 1905.¹ The new Article 30 (for a copy of which we are indebted to the kindness of the secretary of the International Commission on Nomenclature, Dr. Stiles), is herewith given in full:

"Art. 30.— The designation of type species of genera should be governed by the following rules (*a-g*); applied in the following order of precedence:

"I. Cases in which the generic type is accepted *solely* upon the basis of the original publication.

"(*a*) When in the original publication of a genus, one of the species is definitely designated as type, this species shall be accepted as type regardless of any other considerations. (Type by original designation.)

"(*b*) If, in the original publication of a genus, *typicus* or *typus* is used as a *new* specific name for one of the species, such use shall be construed as 'type by original designation.'

"(*c*) A genus proposed with a single original species takes that species as its type. (Monotypical genera.)

"(*d*) If a genus, without originally designated (see *a*) or indicated (see *b*) type, contains among its original species one possessing the generic name as its specific or subspecific name, either as valid name or synonym, that species or subspecies becomes *ipso facto* type of the genus. (Type by absolute tautonomy.)

"II. Cases in which the generic type is not accepted *solely* upon the basis of the original publication.

"(*e*) The following species are excluded from consideration in selecting the types of genera:

"(*a*) Species which are not included under the generic name at the time of its original publication.

"(*β*) Species which were *species inquirendæ* from the standpoint of the author of the generic name at the time of its publication.

"(*γ*) Species which the author of the genus doubtfully referred to it.

"(*f*) In case a generic name without originally designated type is proposed as a substitute for another generic name, with or without type, the type of either, when established, becomes *ipso facto*, type of the other.

"(*g*) If an author, in publishing a genus with more than one valid

¹ The International Code of Zoölogical Nomenclature as applied to Medicine, Hygienic Laboratory, Bulletin No. 24. Washington: Government Printing Office, 1905. 8vo, pp. 50.

species, fails to designate (see *a*) or to indicate (see *b*, *d*) its type, any subsequent author may select the type, and such designation is not subject to change. (Type by subsequent designation.)

"The meaning of the expression 'select a type' is to be rigidly construed. Mention of a species as an illustration or example of a genus does not constitute a selection of a type.

"III. RECOMMENDATIONS.—In selecting types by subsequent designation, authors will do well to govern themselves by the following recommendations:

"(*h*) In case of Linnæan genera, select as type the most common or the medicinal species. (Linnæan rule,¹ 1751.)

"(*i*) If a genus, without designated type, contains among its original species one possessing as a specific or subspecific name, either as valid name or synonym, a name which is virtually the same as the generic name, or of the same origin or same meaning, preference should be shown to that species in designating the type, unless such preference is strongly contraindicated by other factors. (Type by virtual tautonymy). Examples: *Bos taurus*, *Equus caballus*, *Ovis aries*, *Scomber scombrus*, *Spharostoma globiporum*; contraindicated in *Dipetalonema* (compare species *Filaria dipetala*, of which only one sex was described, based upon one specimen and not studied in detail).

"(*j*) If the genus contains both exotic and nonexotic species from the standpoint of the original author, the type should be selected from the nonexotic species.

"(*k*) If some of the original species have later been classified in other genera, preference should be shown to the species still remaining in the original genus. (Type by elimination.)

"(*l*) Species based upon sexually mature specimens should take precedence over species based upon larval or immature forms.

"(*m*) Show preference to species bearing the name *communis*, *vulgaris*, *medicinalis*, or *officinalis*.

"(*n*) Show preference to best described, best figured, best known, most easily obtainable species, or one of which a type specimen can be obtained.

"(*o*) Show preference to a species which belongs to a group containing as large a number of the species as possible. (De Candolle's rule.)

"(*p*) In parasitic genera, select if possible a species which occurs in man or some food animal, or in some very common and widespread host species.

"(*q*) All other things being equal, show preference to a species which the author of the genus actually studied at or before the time he proposed the genus.

"(*r*) All other things being equal, page precedence should obtain in selecting a type.

¹ "Si genus receptum, secundum jus naturæ et artis, in plura dirimi debet, tum nomen antea commune manebit vulgatissimæ et officinali plantæ."

"(s) In case of writers who habitually place a certain leading or typical species first as 'chef de file,' the others being described by comparative reference to this, this fact should be considered in the choice of the type species.

"(t) In case of those authors who have adopted the 'first species rule' in fixing types, the first species named by them should be taken as types of their genera."

The secretary in presenting the report of the Commission, stated that the Code, as now constituted, would probably cover 90 % of the cases that may arise, and would in all probability prove satisfactory to 90 % of zoölogists.

The Congress adjourned on Friday, to meet in Gratz in 1910, under the presidency of Professor Ludwig von Graff. On Sunday Woods Hole was visited *en route* to New York, the members of the Congress arriving in New York Monday morning and remaining through the week. The Congress was received on Monday by the trustees and officers of the Department of Zoölogy of Columbia University; on Tuesday as guests of the trustees and officers of the American Museum of Natural History; on Wednesday the Congress visited Cold Spring Harbor, as guests of the Brooklyn Institute of Arts and Sciences and the Carnegie Station for Experimental Evolution; Thursday was devoted to visits to the New York Zoölogical Park and Aquarium; on Thursday an excursion was made to West Point and Castle Rock, the residence of Professor Henry Fairfield Osborn, as guests of Professor Osborn. On Saturday many of the members accepted invitations from the trustees of Yale University and Princeton University to visit New Haven and Princeton. During the following week the foreign members and delegates visited Philadelphia, Washington, Niagara Falls, and Toronto.

The chief advantage of such gatherings is, of course, the opportunity thus afforded of bringing together for social intercourse a large number of investigators who otherwise may never know each other except through correspondence or published writings. In the present case many of the foreign delegates made their first acquaintance with American scientific institutions, in which they found much of interest and not a little to admire.

THE TWENTY-FIFTH ANNUAL CONGRESS of the American Ornithologists' Union will be held in Philadelphia, beginning on the evening of Monday, December 9, 1907. The evening session will be for the election of officers and members and for the transaction of routine business. Tuesday and the following days of the session will be for the presentation and discussion of scientific papers, and will be open to the public. Members intending to present communications are requested to forward the titles of their papers to the Secretary, Mr. John H. Sage, Portland, Conn., so as to reach him not later than December 5.

INDEX TO VOLUME XXIV.

[New generic, specific, and subspecific names are printed in **heavy-faced** type.]

- ABBOTT, Clinton G., summer bird-life of the Newark, New Jersey, Marshes, 1-11; American Coot nesting near Newark, N. J., 436.
- Acanthis*, 199.
 hornemanni exilipes, 79, 403.
 linaria, 79, 107, 126, 188, 404.
 linaria holboëllii, 79, 404.
 linaria rostrata, 79, 404.
- Accipiter atricapillus*, 72, 110, 142, 182-186, 187, 214, 437.
 bicolor schistochlamys, 290.
 cooperi, 17, 49, 72, 260, 283, 432.
 velox, 17, 49, 72, 260, 428.
- Actitis*, 198.
 macularia, 16, 95, 254, 427, 432.
- Actodromas bairdi*, 94, 253, 425.
 fuscollis, 140, 339, 425.
 maculata, 95, 253, 425.
 minutilla, 95, 253, 425.
- Æchmophorus occidentalis*, 419.
- Ægialeus semipalmatus*, 291.
- Ægialitis collaris*, 291.
 meloda, 428.
 semipalmata, 95, 427.
- Aëronautes melanoleucus*, 390.
- Æthia*, 190.
- Æthya*, 190.
- Agelaius phœniceus*, 8, 11, 19, 51, 78, 284, 433.
 phœniceus arctolegus, 332-336, 397.
 phœniceus fortis, 334.
- Agytria decora*, 295.
- Aix*, 199.
 sponsa, 320, 431.
- Alauda arvensis blakistoni*, 279.
- Alauda trivialis*, 199.
- Albatross*, Black-footed, 58.
 Hutton's Sooty, 454.
- Alca cristatella*, 190.
 psittacula, 198.
 pygmæa, 198.
- Alcella**, 197.
- Alle alle*, 186.
- Allen, Glover M., see Townsend, C. W.
- Allen, J. A., the Rio Grande Seed-eater, its status and technical history, 26-30.
- Allison, Andrew, notes on the spring birds of Tishomingo County, Mississippi, 12-25. See also Beyer, Geo. E.
- Alphéraky, Serguis, notice of his 'The Geese of Europe and Asia,' 229.
- Amaurospiza concolor*, 311.
- Amblycercus holosericeus*, 308.
- American Museum of Natural History, addition of important bird groups in, 368.
- American Ornithologists' Union, Twenty-fourth Congress of, 89-94; Committee on revision of Code of Nomenclature, 119; Committee on Nomenclature and Classification of North American Birds, 119, 367; Twenty-fifth Congress of, 466.
- American Ornithology (magazine), discontinuance of, 239.
- Amizilis cinnamomea*, *cinnamomea*, 295.
 tzacatl dubusi, 295.

- Ammodramus*, 193.
 leconteii, 80.
 maritimus *macgillivrayi*, 102.
 nelsoni, 80.
Ammospiza, 193.
Ampelis, 362.
 cedrorum, 22, 51, 82, 285, 362.
 garrulus, 82, 107, 128, 223.
Anas boschas, 248, 283, 317, 382, 421.
 fulvigula, 318.
 fusca, 198.
 galericulata, 199.
 marila, 191.
 nigra, 198.
 obscura, 318, 382.
 obscura rubripes, 138.
 prima, 191.
 querquedula, 191.
Anderson, Rudolph M., notice of his 'The Birds of Iowa,' 458.
Anhinga, 316.
Anhinga anhinga, 316.
Anous stolidus, 315.
Anser albifrons gambeli, 321.
Anthus, 199.
 antarcticus, 115.
 pensilvanicus, 85.
Antrostomus, 196.
 carolinensis, 18.
 vociferus, 18, 76.
Aphantochroa cuvieri, 295.
Aquila chrysaëtos, 73, 232, 264, 429.
Ara macao, 292.
Aramides albiventris, 359.
 albiventris mexicanus, 359.
 albiventris plumbeicollis, 359.
 axillaris, 359.
 cajanea, 291, 359.
Aramus giganteus, 95.
Archibuteo, 195.
 ferrugineus, 213, 264, 429.
 lagopus sancti-johannis, 73, 263.
Ardea cærulea, 139.
 egretta, 212.
 Ardea Exotica Aurita, 448.
 herodias, 16, 251, 423, 431.
 minuta, 192.
 nycticorax, 195.
 stellaris, 192, 195.
Ardetta, 192.
 exilis, 2, 7, 11.
 neoxena, 338.
Arenaria morinella, 141.
Arnow, I. F., the American Cross-bill in Camden Co., Ga., 439; large set of Brown-headed Nut-hatch's eggs, 447.
Arquatella maritima, 435.
Arremon aurantiostris, 310.
Arremonops conirostris richmondi, 310.
 superciliosus superciliosus, 310.
Asarcia variabilis, 291.
Asio accipitrinus, 74, 97, 268, 438, 439.
 wilsonianus, 74, 267.
Astragalinus tristis, 20, 51, 80, 284, 404, 433.
 tristis pallidus, 404.
Asturina nitida, 288, 290.
Athene noctua, 192.
Atthis caliope, 312.
Attila citreopygia citreopygia, 303.
 citreopygia luteola, 303.
Audubon, John James, letters of, to Spencer F. Baird, 53-70; notes on the ornithological works of, 226; his 'Ornithological Biography,' 349.
Audubon Societies, National Association of, second annual meeting, 120.
Auk, Little, 186.
Australian Ornithologists' Union, sixth annual session of, 240.
Automolus erceretus, 299.
 pallidigularis, 287.
 virgatus, 299.
Avis Marylandica Guttare Luteo, 448.

- Avocet, American, 253, 413, 414, 415, 416, 424.
- Aythya, 190.
affinis, 9, 49, 158, 249, 320, 422.
americana, 158, 249, 320, 422.
collaris, 139, 320.
marila, 320, 422.
vallisnaria, 139, 158, 320, 422.
- BÆOLOPHUS bicolor, 25, 285, 435.
- Bailey, H. H., Mortality among Kingfishers, 439.
- Baird, Spencer F., letters of, to John James Audubon, 53-70.
- Baldpate, 248, 318, 386, 414, 417, 421.
- Baldwin, Roger N., a Woodcock nesting in St. Louis, Mo., 339.
- Bangs, Outram, on a collection of birds from western Costa Rica, 287-312; notice of his review of the Wood Rails (genus *Aramus*) occurring north of Panama, 359; notice of his 'Notes on Birds from Costa Rica and Chiriqui,' 453. See also Thayer, John E.
- Bartramia longicauda, 254, 427.
- Basileuterus rufifrons delatarii, 306.
semicervinus veraguensis, 306.
veraguensis, 287.
- Bec-scie, 317.
- Bec-scie de mer, 317.
- Beebe, C. William, notes on the early life of Loon Chicks, 34-41; notice of his 'The Bird, Its Form and Function,' 112; notice of his 'Owls of the Nearctic Region,' 362.
- Bent, A. C., the Marbled Godwit on its breeding grounds, 160-167; Whistling Swan (*Olor columbianus*) in Massachusetts, 212; the American Rough-legged Hawk breeding in North Dakota, 213; summer birds of southwestern Saskatchewan, 407-430.
- Berlepsch, Hans Graf von, notice of 'Descriptions of New Species and Subspecies of Neotropical Birds,' 359; notice of his 'Studien über Tyranniden,' 360; notice of his 'On the Genus *Elania* Sundev.' 360.
- Berlepsch, Hans Graf von, and Jean Stolzmann, notice of their 'Rapport sur les nouvelles Collections ornithologiques faites au Pérou par M. Jean Kalinowski,' 361.
- Beyer, Geo. E., Andrew Allison, and Henry H. Kopman, list of birds of Louisiana, Part III, 314-321.
- Bigelow, Henry B., on hybrids between the Mallard (*Anas boschas*) and certain other Ducks, 382-388.
- Bird, Man-o'-War, 317.
- Bittern, American, 7, 11, 49, 251, 414, 416, 423.
Cory's, 338.
Least, 2, 7, 11.
- Blackbird, Brewer's, 88, 400, 412.
Red-winged, 8, 11, 19, 51, 78, 172, 174, 180, 284, 332-336, 397, 416, 433.
Rusty, 51, 123, 400.
Yellow-headed, 78, 100, 397, 414, 416.
- Blackwelder, Eliot, notice of his Report on Birds observed in China, 453.
- Blake, Francis G., the nesting of *Stelgidopteryx serripennis* in Norwich, Vt., 103; a New Hampshire record for *Stelgidopteryx serripennis*, 104.
- Blake, Francis G. and Maurice C., Baird's Sandpiper at Newfound Lake, Hebron, N. H., 94.
- Blake, Maurice C., notes from western New York, 224. See also Blake, Francis G.

- Blandford, William Thomas, biographical notice of, 118.
- Blatchley, W. S., the Brown Pelican in Indiana, 337.
- Bluebird, 25, 52, 87, 173, 175, 178, 179, 285, 435.
Mountain, 245.
- Bobolink, 19, 78, 178.
- Bob-white, 16, 58, 71, 174, 283, 432.
- Bombycilla, 362.
- Bonasa, 198.
umbellus togata, 71.
- Booby, 316.
- Botaurus, 195.
lentiginosus, 7, 11, 49, 251, 423.
- Braislín, William C., notes concerning certain birds of Long Island, New York, 186-189; a correction: concerning the occurrence of *Numenius borealis* on Long Island, 341.
- Brancher, 320.
- Branta bernicla, 321.
canadensis, 49, 250, 283, 321, 423.
canadensis hutchinsii, 251, 321.
- Brant, 321.
- Brewster, William, concerning certain supposed instances of the occurrence of the Cinnamon Teal in Florida and South Carolina, 154-157; notes on the Black Rail of California, 205-210; aggressive Screech Owls, 215; breeding of the Rough-winged Swallow in Berkshire County, Mass., 221.
- Brimley, H. H., White-winged Crossbill at Raleigh, N. C., 220.
- British Ornithologists' Club, notice of report of a Committee of, on the Immigration of Summer Residents in the Spring of 1906, 357.
- Brock, Henry H., recent occurrence of the European Teal and the Marbled Godwit near Portland, Maine, 94.
- Brooks, Allan, a hybrid Grouse, Richardson's + Sharp-tail, 167-169.
- Brooks, Winthrop S., the Stilt Sandpiper in Massachusetts, 437.
- Brotogerys jugularis, 292.
- Brown, Frank A., a Florida Gallinule on the coast of Massachusetts, 97.
- Brown, Nathan Clifford, note on the Clapper Rail in Maine, 95; the Raven near Portland, Maine, 100;
- Brownson, W. H., Connecticut Warbler in Maine, 105.
- Buarremon assimilis, 310.
costaricensis, 288, 310.
- Bubo virginianus, 50, 74.
virginianus pallescens, 268.
virginianus saturatus, 75.
virginianus subarcticus, 75.
- Bucco dysoni, 293.
- Buffelhead, 321.
- Buller, Walter Lawry, biographical notice of, 119.
- Bunting, Indigo, 21, 81, 173, 174, 176, 178, 181, 323, 431, 433.
Lark, 409, 410.
Lazuli, 245.
Painted, 173, 174, 180.
Slate-colored, 279.
Yellow-breasted, 279.
- Buteo borealis, 17, 72, 283, 429, 432.
borealis calurus, 72, 262.
borealis harlani, 262.
lineatus, 72, 432.
swainsonii, 72, 262, 429.
platypterus, 17, 72.
- Butorides virescens, 8, 11, 16, 432.
virescens maculata, 289.
- Buzzard, Turkey, 174.
- CASICUS microrhynchus, 308.
- Calcarius lapponicus, 80, 126, 223, 370, 405.
ornatus, 405.

- Calcarius pictus*, 126.
Calidris, 195.
 arenaria, 426.
California Academy of Science's
 Expedition to Galapagos Archi-
 pelago, return of, 240.
Calliope calliope, 278.
Callipepla squamata, 344.
Calospiza guttata chrysophrys, 308.
 gyroloides, 308.
 larvata fanny, 308.
Calypte anna, 313.
 costæ, 313.
Cameron, E. S., the birds of Custer
 and Dawson Counties, Montana,
 241-270, 389-406.
Campophilus guatemalensis buxans,
 293.
Camptolaimus, 191.
Camptostoma pusilla flaviventre,
 301.
Canachites canadensis canace, 87.
Canard cheval, 320.
 français, 318.
 gris, 319.
 noir, 320.
Caprimulgus carolinensis, 196.
Capsiempis flaveola, 287.
Cardinal, 21, 81, 128, 146, 170, 171,
 172, 173, 174, 285, 431, 433.
Cardinalis cardinalis, 21, 81, 128,
 146, 285, 433.
Carpodacus, 199.
 erythrurus grebnitzkii, 279.
 mexicanus, 107.
 mexicanus rhodocolpus, 107.
 purpureus, 19, 79, 124, 144, 284.
Carduelis, 199.
 carduelis, 79.
Carpenter, F. W., telescope observa-
 tions of migrating birds, 107.
Casimorinchos, 451.
Cassinia, a Bird Annual, see Dela-
 ware Valley Orn. Club.
Catbird, 14, 24, 85, 175, 176, 178,
 181, 412, 435.
Catharista urubu, 17.
Cathartes, 198.
 aura, 17, 72, 259, 283, 428, 432.
Catharus griseiceps, 288, 304.
 melpomone costaricensis, 304.
Catoptrophorus semipalmatus, 288,
 291.
Cerchneis sparveria, 290.
Cercomacra tyrannina crepera, 296.
Centrocerus phasianus, 258.
 urophasianus, 428.
Centurus carolinus, 18, 76, 284, 433.
 tricolor, 286.
Ceophlœus, 197.
 lineatus, 293.
 pileatus, 18, 50, 270.
 pileatus abieticola, 76, 432.
 scapularis, 293.
Certhia familiaris americana, 52, 86,
 225, 285, 435.
Ceryle alcyon, 17, 50, 75, 269, 432.
 amazona, 294.
 americana septentrionalis, 294.
 torquata torquata, 294.
Chæmepella, 192.
 minuta, 288, 392.
 rufipennis rufipennis, 392.
Chætura pelagica, 18, 50, 76, 433.
Chamæthlypis caninucha, 306.
Chapin, James, capture of Law-
 rence's Warbler on Staten Island,
 N. Y., 343.
Chapman, Frank M., the eastern
 forms of *Geothlypis trichas*, 30-34;
 notice of his 'The Warblers of
 North America,' 227-229.
Charadrius dominicus, 141, 223, 255.
Charitonetta albeola, 250, 321, 422.
Chasmorhynchus, 451.
 tricarunculatus, 303.
Chat, Yellow-breasted, 24, 88, 173,
 174, 329, 331, 434.
Chaulelasmus streperus, 139, 248,
 318, 421.
Chen cærulescens, 321.
 hyperborea, 139, 250, 321.

- Chen hyperborea nivea*, 321.
 rossii, 211, 250.
Chewink, 189.
Chickadee, Black-capped, 52, 86.
 Carolina, 25, 170, 172, 174, 435.
 Hudsonian, 86, 107, 128.
 Long-tailed, 243, 245.
Chiroxiphia linearis, 303.
Chlorocerys fulgentissima, 361.
 hedwigæ, 361.
Chlorophanes spiza exsul, 306.
Chlorostilbon assimilis, 295.
Chondestes grammacus, 20, 80.
Chordeiles virginianus, 18.
 virginianus henryi, 389.
Chrysocantor æstiva æstiva, 306.
Chuck-wills-widow, 14, 18, 58, 179.
Cinclus ardesiacus, 105.
 mexicanus, 105.
Circus hudsonius, 72, 259, 428.
Cistothorus palustris, 52.
 stellaris, 85.
Clark, Austin H., characteristic
 Kamchatkan birds, 278-280; no-
 tice of his 'Eighteen new species
 and one new Genus of Birds from
 Eastern Asia and the Aleutian
 Islands,' 453.
Clarke, Hubert Lyman, notice of
 his 'The Birds of Amherst and
 Vicinity,' 236.
Clarke, Wm. Eagle, notice of his
 'On the Birds of the Weddell
 and adjacent Antarctic Seas,' 454.
Clais guimeti, 296.
Clangula, 191.
 clangula americana, 249, 320.
Claravis pretiosa pretiosa, 292.
Coccothraustes vespertinus, 107.
 vespertinus montanus, 401.
Coccyzus americanus, 17, 75, 432.
 erythrophthalmus, 75, 269.
 minor minor, 292.
Cœligena, 196.
Cœreba mexicana, 308.
Colaptes auratus, 18, 50, 270.
 auratus luteus, 76, 284,
 433.
 ayresii, 66.
 cafer collaris, 270.
 hybridus, 66.
Cole, Leon J., notice of his 'Verte-
 brata from Yucatan,' 237.
Colibri delphinae, 296.
Colinus virginianus, 17, 50, 71, 76,
 283, 432.
Columba carunculata, 192.
 nigrirostris, 292.
 passerina, 192.
 rufina, 291.
 speciosa, 291.
Columbigallina, 192.
Colymbus, 190, 199.
 arcticus, 199.
 auritus, 314, 377, 419.
 cristatus, 190.
 holboëllii, 419.
 nigricollis ruficollis, 247.
 nigricollis californicus, 419.
 ruficollis, 190.
Compsothlypis americana ramelinae,
 22, 329, 434.
 americana usneæ, 51, 83.
Contopus, 192, 451.
 richardsonii, 392.
 virens, 19, 50, 433.
Conuropsis, 198.
Conurus, 198.
 carolinensis, 198.
 guianensis, 198.
Cooke, Wells W., notice of his 'Dis-
 tribution and Migration of Ducks,
 Geese, and Swans,' 232; many
 eyes are better than one pair, 346-
 348.
Coot, American, 2, 8, 11, 16, 252,
 283, 414, 416, 424, 436.
Cormorant, Double-crested, 137,
 247, 316, 415, 420.
 Florida, 316.
 Mexican, 317.
Coropipo leucorrhœa altera, 303.

- Corvus americanus*, 393.
 brachyrhynchos, 19, 51, 78, 284, 433.
 corax kamtschaticus, 280.
 corax principalis, 50, 76, 100.
 corax sinuatus, 393.
 corone orientalis, 280.
 cryptoleucus, 393.
Coturniculus, 193.
 savannarum passerinus, 80, 145, 433.
Cowbird, 173, 174, 396.
Crane, Little Brown, 251, 423.
 Sandhill, 251, 424.
 Whooping, 58, 88.
Crax panamensis, 290.
Creeper, Brown, 52, 86, 109, 181, 225, 285, 435.
Crossbill, American, 51, 79, 107, 125, 220, 243, 402, 413, 439.
 Bendire, 271, 278, 440.
 Mexican, 101.
 White-winged, 79, 101, 107, 125, 145, 220, 349, 442.
Crow, American, 19, 51, 78, 174, 284, 393, 433.
 Fish, 174.
 Kamchatkan Carrion, 280.
Crymophilus, 196.
Cryptoglaux acadica, 74.
 tengmalmi richardsoni, 74, 111.
Crypturus soui modestus, 290.
Cuckoo, Black-billed, 75, 246, 269.
 Eastern, 279.
 Yellow-billed, 17, 75, 170, 172, 173, 174, 432.
Cuculus canorus telephonus, 279.
Curlew, Hudsonian, 341.
 Long-billed, 409, 415, 427.
Cyanecula, 193.
Cyanerpes cyaneus, 306.
 lucidus, 307.
 lucidus isthmicus, 288, 306.
Cyanocephalus cyanocephalus, 394.
Cyanocitta cristata, 19, 50, 77, 284, 433.
Cyanocompsa concreta cyanescens, 311.
Cyanolæmus, 196.
Cyanospiza, 199.
 cyanea, 21, 81, 323, 433.
Cyanosylvia, 193.
Cyclorhynchus, 197.
Cynanthus, 192.
 latirostris, 192.
DACNIS cayana callaina, 308.
 venusta, 308.
Dafila acuta, 249, 282, 319, 384, 422.
Daggett, Frank S., the Whistling Swan in northeastern Illinois, 337; *Petivers' Gazophylacium*, 448.
Dame, Alfred M., a new White-throat song, 102.
Daption capensis, 454.
Davenport, Mrs. Elizabeth B., notice of her 'Birds of Bennington and Windham Counties, Vermont,' 456.
Deane, Ruthven, unpublished letters of John James Audubon and Spencer F. Baird, 53-70; Audubon's Ornithological Biography, 111; unusual abundance of the American Goshawk (*Accipiter atricapillus*), 182-186; Great Gray Owl (*Scotiaptex nebulosa*), 215; Great Gray Owl (*Scotiaptex nebulosa*) in Rhode Island, 215; the Snowy Owl (*Nyctea nyctea*) not generally abundant in the winter of 1906-1907, 217; American Hawk Owl (*Surnia ulula caparoch*) in Rhode Island, 219.
Delaware Valley Ornithological Club, notice of 'Proceedings' for 1906, 237.
Dendragapus canadensis, 49.
 obseurus richardsonii, 167.
Dendrobates ceciliæ, 287.
Dendroicichla anabatina anabatina, 299.

- Dendrocolaptes sancti-thomæ*, 300.
sancti-thomæ hesperius, 288, 298.
Dendrocops sancti-thomæ, 300.
Dendrocygna fulva, 321.
Dendroica æstiva, 23, 52, 83, 329, 434.
 blackburniæ, 23, 52, 84, 330.
 cærulescens, 23, 52, 83, 330.
 castanea, 23, 84, 330.
 cerulea, 84, 225, 329, 361, 434, 446.
 coronata, 23, 83, 285, 330.
 discolor, 24, 84.
 kirtlandi, 84.
 maculosa, 23, 52, 84, 330.
 palmarum, 23, 84, 225, 330.
 pennsylvanica, 23, 84, 306, 329.
 rara, 361.
 striata, 23, 84, 146, 330, 380.
 tigrina, 22, 52, 83, 330, 446.
 vigorsii, 23, 52, 84, 225, 349.
 virens, 23, 52, 84, 330.
Dendroornis lachrymosa eximia, 299.
 nana costaricensis, 299.
 Dickcissel, 173, 174, 180, 433.
 Dionne, C. E., notice of his 'Les Oiseaux de la Province de Québec,' 236.
Dolichonyx oryzivorus, 19, 78.
 Dos-gris, 320.
 de mer, 320.
 Douglass, Thomas Henry, biographical notice of, 366.
 Dove, Mourning, 17, 72, 174, 189, 242, 259, 283, 428, 432.
 Dovekie, 186.
 Dowitcher, Long-billed, 425.
Dromococcyx phasianellus, 292.
Dryobates borealis, 18, 159, 349.
 nuttalli, 68.
 pubescens, 18, 50.
 pubescens medianus, 75, 284, 432.
 pubescens oreæus, 270.
 villosus, 50, 75, 270, 284, 432.
Dryobates villosus audubonii, 17.
 Dryotomus, 197.
 Duck, American Golden-eye, 249.
 American Scaup, 320, 417.
 Black, 318, 320, 382.
 Bufflehead, 250, 321, 422.
 Canvas-back, 139, 158, 320, 414, 416, 422.
 Florida, 318.
 French, 318.
 Fulvous Tree, 321.
 Lesser Scaup, 9, 49, 158, 249, 320, 417, 422.
 Redhead, 158, 249, 320.
 Red-legged, 138.
 Ring-necked, 139, 320, 417.
 Ruddy, 158, 249, 321, 414, 416, 423.
 Scaup, 422.
 Wood, 320, 431.
 Dumetella, 193.
 felivox, 193.
 Dysporus, 194.
 EAGLE, Bald, 17, 49, 174, 232, 265, 283.
 Golden, 73, 232, 243, 244, 264, 429.
 Gray Sea, 232.
 Kamchatkan Sea, 280.
 Northern Bald, 73, 429.
Ectopistes migratorius, 71.
Egretta candidissima, 436.
 Eider, American, 250.
 Eifrig, G., *Scarlet Tanager (Piranga erythromelas)* at Ottawa, Canada, 103; early appearance of certain northern species at Ottawa, Canada, 110; *American Goshawk (Accipiter atricapillus)* versus *Man and Barred Owl*, 437.
 Elænia, 360.
Elainea albivertex, 302.
 chiriquensis, 301.
 flavogastra subpagana, 301.
 sordidata, 301.

- Elanoides forficatus*, 17, 87.
 furcatus, 290.
Elvira chionura, 296.
Emberiza variabilis, 453.
Emberizoides macrourus hypochondriacus, 309.
 sphenura, 310.
 sphenura hypochondriacus, 288, 309.
Embody, G. C., Bachman's Warbler breeding in Logan County, Kentucky, 41, 42.
Empidonax canescens, 99.
 flaviventris, 19, 50, 77, 144, 302, 328.
 griseus, 99.
 hammondi, 392.
 minimus, 19, 50, 77, 392.
 pusillus traillii, 361.
 sp., 433.
 traillii, 19, 392.
 traillii alnorum, 77, 302, 349.
 traillii traillii, 302.
 virescens, 19, 87, 99.
Ereunetes pusillus, 253, 426.
 occidentalis, 288, 291.
Erismatura jamaicensis, 158, 321, 423.
 rubida, 250.
Estabrook, A. H., the present status of the English Sparrow problem in America, 129-134.
Eucometis spodocephala, 309.
 spodocephala stictothorax, 288, 309.
Eumomota superciliaris australis, 294.
Euphagus carolinus, 51, 78, 123.
 cycnocephalus, 88.
Euphonia crassirostris, 308.
 gracilis, 308.
 leucaeapilla, 308.
 minuta humilis, 308.
FALCO columbarius, 73, 214, 266.
 islandus, 73.
 Falco lagopus, 195.
 mexicanus, 244, 265, 429.
 peregrinus anatum, 73, 244, 266.
 richardsoni, 267, 429.
 sparverius, 49, 73, 283, 429, 432.
 sparverius phalcena, 267.
Falcon, Prairie, 243, 244, 265, 429.
Faxon, Walter, additional notes on the Brewster's Warbler in the Arnold Arboretum, Jamaica Plain, Mass., 444; *Helminthophila leucobronchialis* (Brewst.) in Lexington, Mass., 444; a Mockingbird (*Mimus polyglottos*) in Lexington, Mass., in winter and summer, 446.
Felger, A. H., a card system of note-keeping, 200-205; Ross's Snow Goose in Colorado, 211; the Prothonotary Warbler in Colorado, 342.
Ferry, John F., ornithological conditions in northeastern Illinois, with notes on some winter birds, 121-129; winter bird notes from extreme southern Illinois, 281-286; further notes from extreme southern Illinois, 430-435.
Field, Herbert Haviland, the Concilium Bibliographicum as a Bureau of Ornithological Information, 117.
Finch, Pine, 80, 107.
 Purple, 19, 51, 79, 124, 144, 181, 284.
Fleming, James H., birds of Toronto, Canada. Part II, Land Birds, 71-89; notice of his 'The Disappearance of the Passenger Pigeon,' 357; notice of his 'The Unusual Migration of Brünnich's Murre (*Uria lomvia*) in eastern North America,' 364.
Flicker, Golden-winged, 18, 108, 174, 270.

- Flicker, Hybrid, 411.
 Northern, 50, 76, 284, 433.
 Red-shafted, 270.
Floricola superba, 296.
Florida cærulea, 338.
Florisuga mellivora, 295.
 Flycatcher, Acadian, 87.
 Alder, 77, 181, 413.
 Crested, 18, 76, 170, 171, 174, 175, 180.
 Great-crested, 433.
 Green-crested, 19, 99, 170, 171, 174, 180.
 Hammond's, 392.
 Least, 19, 50, 77, 181, 392, 412.
 Olive-sided, 50, 77, 224.
 Traill's, 19, 349, 392.
 Wright's, 413.
 Yellow-bellied, 19, 50, 77, 144, 224, 328.
 Forbes, S. A., notice of his 'An Ornithological Cross-section of Illinois in Autumn,' 358.
 Forbush, Edward Howe, notice of his 'Useful Birds and their Protection,' 234.
Formicarius hoffmanni hoffmanni, 298.
 nigrifrons, 298.
Formicivora boucardi, 296.
Fregata, 195.
 aquila, 316, 365.
Fringilla cannabina, 199.
 carduelis, 199.
 linaria, 199.
 macroura, 309.
 rosea, 199.
 Fuertes, Louis Agassiz, the Glossy Ibis in central New York, 338.
Fulica americana, 2, 8, 11, 17, 252, 283, 424, 436.
Fuligula, 191.
 GADWALL, 138, 248, 414, 417, 421.
Galbula melanogenia, 293.
Galeoscoptes, 193, 451.
 carolinensis, 24, 85, 435.
Gallinago, 190.
 delicata, 95, 253, 425.
 media, 191.
Gallinula galeata, 1, 4-6, 9-11, 97.
Gallinule, Florida, 1, 4-6, 9-11, 97.
 Gannet, 316.
Gavia imber, 34-41, 49, 158, 314.
Gelochelidon nilotica, 137, 315.
Geothlypis agilis, 85, 105, 222, 225.
 formosa, 24.
 macgillivrayi, 344.
 philadelphia, 85, 328, 330.
 trichas, 30.
 trichas brachidaactyla, 24, 33, 52, 85, 329, 434.
 trichas ignota, 30, 32.
 trichas trichas, 33.
Geranospizias niger, 290.
Glaucidium, 192.
 gnoma, 269.
Glaucionetta, 191.
Glaucis hirsuta æneus, 288, 295.
Glyphorhynchus cuneatus, 299.
Gnatcatcher, Blue-gray, 25, 86, 170, 174, 222, 226, 381, 435, 447.
 Godman, F. DuCane, see Salvin, Osbert.
Godwit, Hudsonian, 253, 426.
 Marbled, 94, 160-167, 415, 416, 426.
 Goeldi, Emilio A., notice of his 'Album de Aves Amazonicas,' 455.
 Golden-eye, American, 320.
 Goldfinch, American, 14, 20, 51, 80, 284, 404, 433.
 European, 79.
 Western, 404.
Goose, Blue, 321.
 Canada, 49, 58, 250, 321, 423.
 Greater Snow, 321.
 Hutchins's 58, 251, 321.
 Lesser Snow, 139, 250, 321.
 Ross's Snow, 211, 250.
 Snow, 58.

- Goose, White-fronted, 321.
- Goshawk, American, 72, 110, 142,
182-186, 187, 214, 260-262,
437.
- Grackle, Boat-tailed, 172, 174, 180.
Bronzed, 19, 51, 78, 401, 433.
Florida, 170, 174, 180.
Purple, 180.
Rusty, 78, 109.
- Grallaria lizanoi, 298.
- Granger, Helen, the breeding of
Brewster's Warbler near Boston,
Mass., 343.
- Grebe, American Eared, 247, 414,
416, 419.
Holbccl's, 419.
Horned, 314, 377, 416, 419.
Pied-billed, 3, 11, 247, 314.
Western, 414, 416, 419.
- Grosbeak, Evening, 78, 124, 144.
Pine, 79, 107, 111, 124.
Rose-breasted, 21, 81, 176, 177,
221, 442.
Western Evening, 401.
- Grouse, Canada, 49.
Canadian Ruffed, 71.
Canadian Spruce, 87.
Hybrid, 167-169.
Prairie Sharp-tailed, 256-258,
410, 428.
Richardson's, 167-169.
Sage, 243, 258, 428.
Sharp-tailed, 167-169, 243.
- Grus americana, 88.
canadensis, 251, 423.
mexicana, 251, 423.
- Guara alba, 159.
- Gull, American Herring, 247.
Black-backed, 280.
Bonaparte's, 247, 313.
California, 413, 415, 419.
Franklin's, 313, 413, 416, 419.
Glaucus, 94.
Herring, 49, 233, 313.
Iceland, 223.
Laughing, 40, 313.
Gull, Ring-billed, 136, 247, 313, 413,
415, 419.
Sabine's, 247.
Slaty-backed, 280.
- Gymnocichla nudiceps, 287.
nudiceps *erratis*, 288, 297.
- Gymnopithys bicolor olivascens,
296.
- Gypagus, 198.
- Gyr Falcon, White, 73.
- HALÆTUS albicilla, 232.
leucocephalus, 17, 49, 232, 265,
283.
leucocephalus alascanus, 73,
429, 429.
- Halobæna cærulea, 454.
- Harelda, 191.
hyemalis, 321.
- Harlow, Richard C., unusual occur-
rence of the Short-eared Owl in
Pennsylvania, 438.
- Hartert, Ernest, notice of his 'Die
Vögel der Paläarktischen Fauna,'
Heft IV, 362.
- Harvie-Brown, J. A., notice of his
'A Fauna of the Tay Basin,' 115.
- Hawk, American Rough-legged, 73,
213, 263.
American Sparrow, 14, 49, 73,
430.
Broad-winged, 17, 73, 179.
Cooper's, 17, 49, 72, 180, 260,
283, 432.
Desert Sparrow, 267.
Duck, 73, 224, 243, 244, 266.
Florida Red-shouldered, 174.
Harlan's, 262.
Harris's, 58.
Marsh, 72, 259, 414, 428.
Pigeon, 73, 214, 266.
Red-shouldered, 14, 72, 432.
Red-tailed, 17, 72, 283, 429,
432.
Sharp-shinned, 17, 49, 72, 174,
180, 260, 428.

- Hawk, Sparrow, 283, 411, 432.
Swainson's, 72, 262, 411, 429.
Western Red-tail, 72, 262.
- Hazard, R. G., the Great Carolina Wren in southern Rhode Island, 446.
- Heleodytes capistratus capistratus, 304.
- Helinaia swainsonii, 45.
- Heliotrix barroti, 296.
- Hellmayr, C. E., notice of his 'Revision der Spix'schen Typen brasilianische Vögel,' 113; notice of his 'Critical Notes on the Types of Little-known Species of Neotropical Birds,' 231; notice of his 'Notes on a second collection of Birds from the District of Pará, Brazil,' 231.
- Helminthophila, 193.
bachmani, 41-48, 159, 348, 378.
celata, 83, 328.
celata orestera, 379.
chrysoptera, 88, 224, 329, 444.
lawrencei, 342, 343.
leucobronchialis, 343, 443, 444.
peregrina, 83, 224, 328, 348.
pinus, 22, 224, 328, 443, 445.
ruficapilla, 51.
rubricapilla, 83, 329.
virginia, 344.
- Helmitherus vermivorus, 22.
- Helodromas solitarius, 95, 254, 426, 432.
solitarius cinnamomeus, 426.
- Hen, Prairie, 87.
- Henderson, Junius, nesting of Cross-bills in Colorado, 440.
- Henicorhina pittieri, 287.
prostheleuca pittieri, 305.
- Henninger, W. F., two birds new for Ohio (*Oceanites oceanicus* and *Merula migratoria achrustera*), 447.
- Herman, Otto, notice of his 'The International Convention for the Protection of Birds,' etc., 456.
- Heron, Black-crowned Night, 140, 432.
Great Blue, 16, 49, 58, 251, 423, 431.
Great White, 58.
Green, 8, 16, 432.
Little Blue, 139, 338.
Snowy, 436.
Yellow-crowned, 187, 377.
- Hesperiphona vespertina, 78, 124, 144.
- Heteractitis incanus, 340.
- Higbee, H. G., the Blue-gray Gnatcatcher in Massachusetts, 222; an intergrade between *Helminthophila pinus* and *H. leucobronchialis* captured in Hyde Park, Mass., 443.
- Himantopus mexicanus, 344.
- Hirundo erythrogaster, 21, 51, 82.
- Hodoiporus, 194.
- Horizopus, 192.
- Horizopus richardsonii sordidus, 302.
virens, 77.
- Hortulanus, 193.
albicollis, 193.
erythrophthalmus, 193.
nigricollis, 193.
- House-finch, Siberian, 279.
- Howell, Arthur H., and Henry Oldys, the Bewick Wren in the District of Columbia, with a description of its song, 149-153; another Connecticut Warbler from Maine, 222.
- Hubel, Frederick C., preliminary list of the summer birds of the Cobalt Mining Region, Nipissing District, Ontario, 48-52.
- Hummingbird, Hybrid, 312.
Broad-tailed, 313.
Calliope, 390.
Ruby-throated, 18, 50, 76, 174, 180, 390, 433, 448.
- Hydrochelidon nigra surinamensis, 211, 247, 315, 420.

- Hyalobrontes**, 198.
Hylocharis eliciæ, 295.
Hylocichla aliciaæ, 25, 86.
 aliciaæ bicknelli, 88.
 aonalaschkæ, 344.
 aonalaschkæ pallasii, 188.
 fuscescens, 25, 52, 86.
 fuscescens salicicola, 88.
 guttata pallasii, 25, 86, 226.
 mustelina, 25, 86, 435.
 swainsoni, 361.
 ustulata swainsonii, 25, 86.
Hylophilus viridiflavus, 287.
Hypocentor aureolus, 279.

IACHE, 192.
Ibis, Glossy, 338.
 Scarlet, 58.
 White, 159.
Icteria virens, 24, 88, 306, 329, 434.
Icterus bullocki, 400.
 galbula, 19, 78, 433.
 spurius, 19, 78, 308, 433.
Idioptilon, 359.
 rothschildi, 359.
International Ornithological Congress, Proceedings of the Fourth, noticed, 352-354.
International Zoölogical Congress, Seventh, proposed Ornithological Section of, 239; meeting of, 462-466.
Iridoprogne albilineata, 305.
 bicolor, 21, 51, 82.
Ixobrychus, 192.

JANNEY, Nath. E., Audubon's Ornithological Biography, 349.
Jay, Canada, 50, 77.
 Blue, 19, 50, 77, 174, 189, 284, 433.
 Piñon, 243, 245, 394.
Jourdain, Francis C. R., notice of his 'The Eggs of European Birds,' Part II, 361.
Junco hyemalis, 51, 81, 102, 284.
 Junco, Pink-sided, 413.
 Slate-colored, 51, 81, 102, 109, 181, 284.

KAMPTORHYNCHUS, 191.
Killdeer, 255, 283, 413, 415, 416, 427, 432.
Kingbird, 18, 50, 76, 173, 174, 177, 180, 390, 412, 433.
 Arkansas, 242, 391, 412.
Kingfisher, Belted, 17, 50, 75, 174, 269, 432, 439.
Kinglet, Golden-crowned, 52, 86, 109, 110, 285.
 Ruby-crowned, 25, 86, 108.
Kite, Mississippi, 174.
 Swallow-tailed, 17, 87, 174.
Kittiwake, 337, 435.
Knaebel, Ernest, a new Colorado Record for the White-winged Crossbill (*Loxia leucoptera*), 101.
Koch, August, biographical notice of, 238.
Kopman, Henry H., aspects of bird distribution in Louisiana and Mississippi, 169-181. See also Beyer, Geo. E.

LAGOPUS lagopus, 71.
 rupestris chamberlaini, 453.
Lampropygia, 196.
Lanio melanopygius, 309.
Lanius borealis, 82, 128, 361.
 ludovicianus, 285, 361, 434.
 ludovicianus migrans, 82.
Lark, Horned, 77, 242, 410.
 Desert Horned, 243, 392.
 Prairie Horned, 77, 284, 452.
Larus argentatus, 49, 233, 247, 282, 314.
 atricilla, 314.
 californicus, 419.
 delawarensis, 136, 247, 282, 314, 419.
 franklinii, 314, 419.
 glaucus, 94.

- Larus leucopterus*, 223.
 philadelphia, 247.
 ridibundus, 280, 314.
 schistasagus, 280.
 Lass, Herbert Ravenal, notice of his
 ' Bird Life of a City Garden,' 364.
Lathria unirufa clara, 303.
Legatus albicollis, 302.
Leptopodon cayennensis, 290.
Leptopogon pileatus, 301.
 pileatus faustus, 288, 300.
Leptotila rufinucha, 292.
 verreauxi, 292.
Lestris pomarinus, 64.
Leucosticte tephrocotis, 402.
 teprocotis littoralis, 403.
Leucosticte, Gray-crowned, 402.
 Hepburn's, 403.
Limonites minutilla, 291.
Limosa fedoa, 94, 160-167, 426.
 hæmastica, 253, 426.
Limpkin, 95.
Linaria, 199.
Linota cannabina, 88.
Lobipes, 196.
Longspur, 409.
 Lapland, 80, 127, 223, 369, 405,
 449.
 Smith's, 127.
 Chestnut-collared, 405.
 McCown's, 406.
 Lönnberg, Einar, notice of his
 'Contributions to the Fauna of
 South Georgia. I. Taxonomic
 and Biological Notes on Verte-
 brates,' 115.
Loon, 34-41, 49, 58, 158, 314.
Lophodytes cucullatus, 248, 282,
 317, 421.
Lophornis adorabilis, 296.
Loxia curvirostra bendirei, 271, 440.
 curvirostra minor, 51, 79, 107,
 125, 214, 220, 271-278, 402,
 439.
 curvirostra stricklandi, 101,
 271.
Loxia leucoptera, 79, 101, 107, 125,
 145, 220, 271, 349, 442.
 MACHETES, 195.
Macrorhamphus, 195.
 scolopaceus, 425.
Magpie, American, 89, 243, 244, 393.
 Kamchatkan, 280.
*Malacoptila panamensis panamen-
 sis*, 293.
Mallard, 58, 248, 282, 317, 382, 414,
 417, 421.
Manacus aurantiacus, 303.
Man-o'-War Bird, 317.
Mareca americana, 247, 319, 386,
 421.
Marila, 190, 191.
 nyroca, 190.
Martin, Purple, 21, 82, 174, 180, 433.
McKeehnie, F. B., notes on the
 ornithological works of John
 James Audubon, 226.
Meadowlark, 78, 178, 284, 409, 433.
 Southern, 19, 173, 174, 179.
 Western, 242, 398.
Megascops, 192.
 asio, 17.
 asio maxwelliæ, 268.
Melanerpes erythrocephalus, 18, 76,
 270, 433.
 chrysauchen, 287, 292.
 wagleri, 292.
Melanitta, 198.
Meleagris gallopavo fera, 87.
 gallopavo sylvestris, 283.
Melospiza cinerea melodia, 51, 81,
 146, 284.
 georgiana, 8, 11, 21, 81, 284.
 lincolnii, 21, 81, 224, 341.
Merganser, 194.
 americanus, 247, 317, 420.
 serrator, 248, 317, 344.
Merganser, American, 247, 317, 415,
 420.
 Hooded, 248, 282, 317, 421.
 Red-breasted, 248, 317.

- Mergus, 194.
 serrator, 194.
- Merlin, Richardson's, 267, 430.
- Mershon, W. B., notice of his
 'The Passenger Pigeon,' 355-357.
- Merula, 194, 451.
 migratoria, 25, 52, 86, 285, 447.
 migratoria acrustera, 447.
- Micrastur guerilla, 289.
 interstes, 289.
 zonothorax, 290.
- Micropalama himantopus, 213, 339,
 437.
- Microtricus semiflavus semiflavus,
 303.
- Miller, Richard F., the Black Tern
 at Philadelphia, Pa., 211; the
 Blue-gray Gnatcatcher in Phila-
 delphia County, Pa., 222; the
 Little Blue Heron in Philadelphia
 County, Pa., 338; the Snowy
 Heron in Camden Co., N. J.,
 436; nesting of the Rose-breasted
 Grosbeak in Philadelphia Co.,
 Pa., 442.
- Mimus polyglottos, 24, 88, 285, 434,
 446.
- Mniotilta varia, 22, 51, 83, 329, 434.
- Mockingbird, 14, 24, 88, 174, 178,
 285, 434, 446.
- Molothrus ater, 78, 396.
- Momotus lessoni, 294.
- Montgomery, Thos. H., Jr., notice
 of his 'The Protection of Our
 Native Birds,' 232; the English
 Sparrow in Texas, 341.
- Morus, 194.
- Motacilla regulus, 195.
 suecica, 193.
 troglodytes, 194.
- Munson, E. L., *Ardea egretta* in
 New Mexico, 212.
- Murphy, Robert C., a wounded
 Sora's long swim, 96.
- Murre, Brünnich's, 364.
- Muscicapa cayanensis, 62.
- Muscicapa flava, 62.
 texensis, 62.
 virescens, 360.
- Muscivora tyrannus, 302.
- Myadestes townsendii, 245.
- Myiarchus cinerascens, 219.
 cooperi, 220.
 crinitus, 18, 76, 433.
 lawrencei, 106.
 lawrencei bangsi, 288, 302.
 lawrencei olivascens, 106.
 lawrencei tresmariae, 106.
 nuttingi nuttingi, 302.
- Myiobius barbatus atricauda, 302.
 xanthopygius sulphureipygius
 302.
- Myiochanes, 451.
- Myiodynastes audax nobilis, 302.
 luteiventris, 302.
- Myiopagis, 360.
 placens accola, 301.
- Myiozetetes similis superciliosus,
 302.
- Myrmelastes exsul occidentalis, 296.
- Myrmotherula menetriesii, 296.
- NANNUS, 194.
- Nash, Chauncey C., the Stilt
 Sandpiper in Massachusetts, 339.
- Nelson, E. W., *Empidonax griseus*
 Brewster vs. *Empidonax canes-*
 cens Salvin & Godman, 99; some
 corrected records, 106.
- Nettion carolinensis, 248, 319, 421.
 georgium, 115.
- Newton, Alfred, notice of his
 'Ootheca Wolleyana,' Part IV,
 354; biographical notice of, 365.
- New York Zoölogical Park, 367.
- Nichols, John Treadwell, the Ves-
 per Sparrow on Long Island,
 N. Y., in winter, 220.
- Nighthawk, 18, 50, 76, 174, 179,
 242, 389, 412.
- Noctua, 192.
 minor, 192.

- Norton, Arthur H., two Ravens (*Corvus corax principalis*) seen at Harpswell, Maine, 100; the Kittiwake (*Rissa tridactyla*) on the coast of Maine in summer, 337; Lincoln's Sparrow (*Melospiza lincolni*) at Portland, Maine, 341; the Kittiwake and Purple Sandpiper again in Maine in summer, 435.
- Numenius borealis, 341.
 hudsonicus, 341.
 longirostris, 254, 427.
- Nuthatch, Brown-headed, 25, 349, 447.
 Red-breasted, 25, 86, 147, 328, 381.
 Slender-billed, 243, 245.
 White-breasted, 25, 86, 159, 180, 285.
 White-bellied, 435.
- Nuttallornis borealis, 50, 77, 224.
- Nyctanassa violacea, 377.
- Nyctea nyctea, 75, 111, 143, 217, 269.
- Nycticorax, 195.
 nycticorax nævius, 140, 187, 432.
- Nyctidromas albigollis, 295.
- Nyroca, 190, 191.
- OBERHOLSER, Harry C., notice of his paper on Birds from German and British East Africa, 230; notice of his 'The North American Eagles and their Economic Relations,' 232; a new *Agelaius* from Canada, 332-336.
- Oceanites oceanicus, 447, 455.
- Odontophorus castigatus, 291.
- Œstelata brevisrostris, 454.
- Oidemia americana, 321.
 deglandi, 139, 321, 423.
 perspicillata, 321.
- Olbiorechilus, 194.
 hiemalis, 85.
- Old-Squaw, 321.
- Oldys, Henry, occurrence of a White-winged Crossbill at Oxen Hill, Md., in August, 442. See also Howell, Arthur H.
- Olor buccinator, 251, 321.
 columbianus, 139, 212, 321, 337, 423.
- Oncorhynchus mexicanus fraterculus, 302.
- Oncostoma cinereigulare, 300.
- Oporornis formosa, 306, 344-346, 434.
 philadelphia, 306.
- Oreomyias, 360.
- Oriole, Baltimore, 19, 78, 174, 176, 433.
 Bullock's, 400.
 Orchard, 19, 78, 170, 180, 433.
- Ornismyia clemenciæ, 197.
 cœligena, 196.
- Oroscoptes montanus, 344.
- Ortalis cinereiceps, 291.
 vetula maccalli, 106.
 wagleri, 106.
- Oryzoborus funereus, 311.
- Osgood, Wilfrid H., identity of *Tyrannula mexicana* Kaup, 219; probable breeding of the Wandering Tattler in the interior of Alaska, 340; '*Helminthophila lawrencei*' near the District of Columbia, 342.
- Osprey, 280.
 American, 74, 174.
- Ossifraga gigantea, 454.
- Otocoris alpestris, 77, 452.
 alpestris arenicola, 392.
 alpestris praticola, 77, 284, 452.
- Otus, 192.
 asio, 74.
 choliba thompsoni, 237.
- Oven-bird, 52, 83, 175, 176, 177, 329, 331.
- Owl, American Barn, 74, 174, 214.
 American Hawk, 75, 219.

- Owl, American Long-eared, 74, 267.
Arctic Horned, 75.
Barred, 17, 74, 284, 432, 437.
Burrowing, 243, 269, 410.
Dusky Horned, 75.
Florida Barred, 174.
Florida Screech, 174.
Great Gray, 74, 215.
Great Horned, 50, 74, 174, 411.
Hawk, 58, 110.
Long-eared, 411.
Pigmy, 269.
Richardson's, 74, 111.
Rocky Mountain Screech, 268.
Saw-whet, 74, 109, 110.
Screech, 17, 50, 215, 217.
Short-eared, 74, 97, 243, 268, 414, 417, 438, 439.
Siberian Hawk, 280.
Snowy, 58, 75, 111, 143, 217, 269.
Western Horned, 243, 268.
Oxyechus vociferus, 255, 283, 427, 432.
PACHYRHAMPHUS cinereiventris, 303.
Pachysylvia decurtata, 305.
 ochraceiceps pallidipectus, 305.
 viridiflava, 305.
Paille-en-queue, 320.
Palmer, T. S., and R. W. Williams, Jr., notice of their Summary of Game Laws for 1906, 234.
Pandion haliaëtus, 280.
 haliaëtus carolinensis, 74, 290.
Paroquet, Carolina, 454.
Partridge, Scaled, 344.
Parus atricapillus, 52, 86.
 atricapillus occidentalis, 245.
 carolinensis, 25.
 hudsonicus, 86.
Passerculus princeps, 101.
 sandwichensis savanna, 97.
 sandwichensis labradorius, 452.
Passer domesticus, 20, 52, 80, 129-134, 341, 404.
Passerella iliaca, 81, 285.
Passerherbulus, 193.
Passerina, 199.
 nivalis, 80, 127.
 sphenura, 309.
Pavoncella, 195.
Peabody, P. B., the Crossbills of Northeastern Wyoming, 271-278.
Pearson, Leonard S., a recent Blue-gray Gnatcatcher (*Poliophtila carulea*) in Delaware Co., Pa., 447.
Pediceetes phasianellus campestris, 256-258, 428.
 phasianellus columbianus, 167.
Pelican, American White, 247, 317, 337, 414, 415, 416, 420.
 Brown, 317, 337.
Pelecanus bassanus, 194.
 erythrorhynchos, 247, 317, 420.
 fuscus, 317, 337.
Penelope cristatus, 291.
Penthestes carolinensis, 435.
 hudsonicus hudsonicus, 107, 128.
Perisoreus canadensis, 50, 77.
Petrel, Antarctic, 254.
 Blue, 254.
 Cape, 254.
 Giant, 254.
 Giant Silver, 254.
Petrochelidon lunifrons, 51, 244, 433.
Peucea aestivalis bachmanii, 20, 349.
Pewee, Western Wood, 392, 413.
 Wood, 19, 50, 77, 174, 180, 433.
Phæonetta, 198.
Phalacrocorax atriceps, 115.
 dilophus, 137, 247, 316, 420.
 dilophus floridanus, 316.
 mexicanus, 317.
Phalænoptilus nuttallii, 389.
Phalarope, Northern, 252, 415, 424.
 Wilson's, 140, 252, 413, 415, 416, 424.
Phalaropus, 196.

- Phalaropus lobatus*, 252, 424.
Phaleris, 197.
Pheugopedius fasciato-ventris melanogaster, 304.
 hyperythrus, 304.
Philohela minor, 339.
Phlœotomus, 197.
Phœbe, 14, 18, 77, 433.
 Say's, 244, 391.
Phœbetria cornicoides, 454.
Phœnicothraupis rubica vinacea, 309.
Piaya cayana thermophila, 292.
Pica pica hudsonica, 89, 244, 393.
 pica kamtschatica, 280.
Picoides americanus, 50, 76.
 arcticus, 50, 76.
Picolaptes compressus compressus, 299.
Picumnus olivaceus flavotinctus, 293.
Picus lineatus, 197.
 nuttalli, 68.
 pileatus, 197.
Pigeon, Passenger, 71, 355-357.
Pinicola enucleator leucura, 79, 107, 111, 124.
Pintail, 282, 384, 414, 415, 417, 422.
Pionus senilis, 292.
Pipastes maculatus, 280.
Pipilo, 193.
 chlorurus, 344.
 erythrophthalmus, 21, 81, 285, 433.
 maculatus megalonyx, 344.
Pipit, American, 85, 178.
 Antarctic, 115.
 Tree, 280.
Pipra mentalis ignifera, 303.
 vetulina, 303.
Pipromorpha assimilis dyscola, 300.
Piranga erythromelas, 21, 81, 103, 433.
 rubra, 21, 82, 361.
 testacea testacea, 309.
Pitangus derbianus derbianus, 302.
Placostomus superciliaris, 300.
Planesticus, 194, 451.
 grayi casius, 304.
 tristis enephosa, 304.
Plectrophenax, 199.
 nivalis, 107, 405.
Plover, American Golden, 255.
 Black-bellied, 427.
 Golden, 141, 223.
 Mountain, 255.
 Piping, 414, 428.
 Semipalmated, 427.
Podasocys montana, 255.
Podiceps, 190, 199.
Podilymbus podiceps, 3, 6, 11, 314.
Pogonotriccus plumbeiceps, 360.
Polioptila caerulea, 25, 86, 222, 226, 381, 435, 447.
 superciliaris superciliaris, 306.
Poœetes gramineus, 20, 51, 80, 220, 442.
Poor-will, 389.
Porzana carolina, 96, 252, 424.
 coturniculus, 205.
 jamaicensis, 208.
 jamaicensis coturniculus, 205-210.
 sharppei, 207.
 silonotus, 207.
Porter, Louis N., the breeding habits of *Empidonax virescens* in Connecticut, 99.
Priocella glacialoides, 454.
Procnias, 450.
Progne chalybea chalybea, 305.
 subis, 21, 82, 433.
Protonotaria citrea, 88, 342, 434.
Psaltiriparus plumbeus cecaumenorum, 115.
Ptarmigan, Willow, 71.
Pteroglossus franzi, 293.
Puffinus borealis, 365.
Pulsatrix perspicillata, 294.
Pygocelis papua, 115.
Pygochelidon cyanoleuca, 306.
Querquedula, 191.

- Querquedula cyanoptera*, 154-157,
158, 319, 421.
discors, 248, 289, 319, 421.
- Quiscalus quiscula æneus*, 19, 51,
78, 401, 433.
purpureus, 19.
- Rail, Black, 208.
California Black, 205-210.
Clapper, 87, 95.
King, 95, 212.
Sora, 96, 252.
Virginia, 96, 252.
Yellow, 108.
- Rallus crepitans*, 87, 95.
elegans, 95, 212.
virginianus, 8, 11, 251.
- Ralph, William LeGrange, bio-
graphical notice of, 461.
- Raven, American, 393.
Kamchatkan, 280.
Northern, 50, 100.
White-necked, 393.
- Recurvirostra americana*, 253, 424.
- Redhead, 249, 416, 422.
- Redpoll, Common, 79, 107, 126, 242,
404.
Greater, 79, 404.
Hoary, 79, 403.
Holböll's, 79, 404.
Lesser, 188.
- Redstart, American, 24, 52, 77, 85,
176, 177, 178, 181, 329, 331,
434.
- Regulus, 195.
calendula, 25, 86.
satrapa, 52, 86, 285.
- Remick, John A., capture of the
Glaucous Gull (*Larus glaucus*)
in Boston Harbor, Mass., 94;
the Junco breeding at Wellfleet,
Mass., 102.
- Rhamphastos tocard, 293.
- Rhamphocerus rufiventris, 296.
- Rhamphocelus costaricensis, 309.
- Rhoads, S. N., that Cinnamon Teal
record from Florida, 435.
- Rhinogryphus, 198.
- Rhodinocinclæ rosea eximeæ*, 306.
- Rhynchophanes meadowii*, 406.
- Rhynchops nigra*, 40, 315.
- Rhynchopsitta pachyrhyncha*, 368.
- Rhyncocyclus brevirostris*, 300.
cinereiceps, 300.
- Rich, Walter H., notice of his
'Feathered Game of the North-
east,' 459.
- Ridgway, Robert, *Cinclus mexi-
canus* not a Costa Rican Bird, 105;
notice of his 'Birds of North and
Middle America,' Part IV, 450.
- Riparia riparia*, 82, 433.
- Rissa tridactyla*, 337, 435.
- Roberts, Thomas S., a Lapland
Longspur tragedy: being an
account of a great destruction of
these birds during a storm in
southwestern Minnesota and
northwestern Iowa in March,
1904, 369-376, 449.
- Robin, American, 14, 25, 52, 58,
86, 108, 110, 178, 285, 412.
- Rough-leg, Ferruginous, 243, 264,
411, 429.
- Ruby-throat, Siberian, 278.
- Rupornis ruficauda*, 290.
- Ruthven, Alexander G., another
specimen of Cory's Bittern, 338.
- SAGE, John H., Twenty-fourth Con-
gress of the American Ornitholo-
gist's Union, 89-94.
- Salpinctes obsoletus*, 244.
- Saltator albicollis*, 287.
magnoides intermedius, 288,
311.
magnoides medianus, 312.
striatipectus isthmicus, 312.
- Salvin, Osbert, and F. DuCane God-
man, notice of the 'Aves' of
their 'Biologia Centrali-Ameri-
cana,' 350-352.
- Sanderling, 426.
- Sandpiper, Baird's, 94, 253, 425.

- Sandpiper, Bartramian, 254, 409, 427.
 Buff-breasted, 437.
 Least, 253, 291, 425.
 Purple, 435.
 Pectoral, 253, 425.
 Semipalmated, 253, 291, 415, 426.
 Solitary, 254, 426, 432.
 Spotted, 16, 49, 254, 291, 413, 415, 416, 427, 432.
 Stilt, 213, 339, 437.
 Western, 291.
 Western Solitary, 426.
 White-rumped, 140, 339, 425.
 Sapsucker, Yellow-bellied, 50, 76, 108, 110.
 Saucerottea niveoventer, 295.
 sophiae, 295.
 Saunders, W. A., a migration disaster in Western Ontario, 108.
 Sayornis, 196.
 nigricans, 196.
 phoebe, 18, 77, 433.
 saya, 244, 391.
 Schiebel, Phil. Guido, notice of his 'Die Phylogenese der Lanius Arten,' 230.
 Sclerurus guatemalensis, 299.
 Scolecophagus carolinus, 400.
 cyanocephalus, 400.
 Scolopax gallinago, 191.
 limosa, 198.
 Scoter, Black, 321.
 Surf, 321.
 White-winged, 139, 321, 417, 423.
 Scotiaptex nebulosa, 74, 215.
 Scotothorus verapacis dumicola, 303.
 Seed-eater, Rio Grande, 26-30.
 Seiurus aurocapillus, 24, 52, 84, 306, 329.
 motacilla, 24, 84, 328, 434.
 noveboracensis, 52, 84, 225, 306, 330, 446.
 Selasphorus alleni, 313.
 floresii, 313.
 platycercus, 313.
 rufus, 312, 313.
 Serrator, 194.
 Setophaga ruticilla, 24, 52, 85, 329, 434.
 Shoveller, 138, 249, 282, 414, 417, 422.
 Shrike, Loggerhead, 14, 174, 179.
 Migrant, 82, 434.
 Northern, 82, 128, 243.
 Shufeldt, R. W., notice of his 'On the Osteology of the Tubinares,' 365.
 Sialia sialis, 25, 52, 285, 435.
 Simorhynchus, 190.
 Siskin, Pine, 126, 159, 181, 405.
 Sitta canadensis, 25, 147, 328, 381.
 carolinensis, 25, 159, 435.
 carolinensis aculeata, 245.
 pusilla, 25, 349, 447.
 Skimmer, Black, 40, 315.
 Smyth, Ellison A., Jr., the Goshawk in Montgomery Co., Virginia, 214;
 Snipe, Wilson's, 253, 425.
 Snow, J. H., ten birds new to the avifauna of Kansas, 344.
 Snowflake, 80, 107, 127, 405.
 Snyder, W. E., late occurrence of the King Rail (*Rallus elegans*) in Wisconsin, 212.
 Solitaire, Townsend's, 245.
 Somateria dresseri, 250.
 Sora, 424.
 Sparrow, Bachman's, 20, 349.
 Chipping, 20, 51, 81, 180, 181, 245.
 Clay-colored, 410, 412.
 English, 20, 52, 129-134, 243, 341, 404.
 Field, 20, 81, 174, 180, 431, 433.
 Fox, 81, 108, 110, 181, 284.
 Grasshopper, 80, 174, 433.
 House, 80.

- Sparrow, Ipswich, 101.
Lark, 20, 80, 174.
Leconte's, 80.
Lincoln's, 21, 81, 110, 224, 341.
Louisiana Seaside, 172, 174.
Macgillivray's, 102.
Nelson's, 80.
Savanna, 80, 97, 110, 145, 178,
181, 340.
Song, 51, 81, 108, 146, 181,
284, 412.
Swamp, 8, 11, 21, 81, 108, 110,
178, 181, 284.
Tree, 81, 108, 110, 384.
Vesper, 20, 51, 80, 181, 220,
409, 410, 442.
Western Lark, 242.
Western Savanna, 416.
White-crowned, 51, 80, 108,
110, 181, 413.
White-throated, 20, 51, 80, 102,
108, 110, 128, 178, 181, 284,
442.
Spatula clypeata, 138, 249, 282, 422.
Speotyto cunicularia hypogaea, 269.
Spermophila albigularis, 26.
moreletti, 26.
parva, 26.
Sphyrapicus varius, 50, 76.
Spinney, Hubert L., the Stilt Sand-
piper,— a correction, 213.
Spinus pinus, 107, 126, 159, 405.
Spiza americana, 309, 433.
Spizella monticola, 81, 284.
pusilla, 20, 81, 433.
socialis, 20, 51, 81, 107.
socialis arizonæ, 107.
Spodesilaura, 193.
Sporophila aurita, 311.
gutturalis, 288, 311.
moreletti, 26.
moreletti moreletti, 311.
moreletti sharpei, 26-30.
Sprigtail, 320.
Squatarola squatarola, 427.
Steganopus tricolor, 140, 253, 424.
Stelgidopteryx ruficollis uropygialis,
305.
serripennis, 21, 82, 103, 104,
221.
Stellula calliope, 390.
Sterna antillarum, 137, 315.
caspia, 137, 224, 232, 315.
forsteri, 137, 315, 420.
fuliginosa, 315.
hirundinacea, 455.
hirundo, 40, 420.
macrura, 454.
maxima, 315.
paradisæa, 454.
sandwichensis acuflavida, 315.
Stiles, Charles Wardell, on rules of
nomenclature, 464.
Stolzmann, Jean, see Berlepsch,
Hans Graf von.
Stone, Witmer, some changes in the
current generic names of North
American birds, 189-199.
Streptoprocne zonaris zonaris, 295.
Strix passerinum, 192.
pratincola, 74, 214.
Sturnella magna, 78, 284, 433.
magna argutula, 19.
magna neglecta, 398.
Sturnus roseus, 194.
Sula, 194.
bassana, 316.
sula, 316.
Surnia ulula caparoch, 75, 110, 219.
ulula doliata, 280.
Swales, B. H., and P. A. Taverner,
recent ornithological develop-
ments in southeastern Michigan,
135-148.
Swallow, Bank, 82, 433.
Barn, 21, 51, 82, 177.
Cliff, 51, 82, 433.
Rough-winged, 21, 82, 103, 104,
174, 221.
Tree, 21, 51, 82, 176, 181.

- Swan, Trumpeter, 251, 321.
 Whistling, 139, 212, 321, 337, 423.
- Swenk, Myron H., two interesting Nebraska records, 223.
- Swift, Chimney, 18, 50, 76, 174, 180, 433.
 White-throated, 390.
- Symphemia semipalmata inornata, 254, 426.
- Synallaxis albescens, 287, 299.
 albescens albigularis, 299.
 albescens *latitabunda*, 288, 298.
 pudica, 299.
- Syrnium varium, 17, 74, 284, 432.
- TACHYBAPTUS, 190.
- Tachyphonus nitidissima, 309.
- Tanager, Scarlet, 21, 81, 103, 176, 177, 181, 433.
 Summer, 21, 81, 174, 175, 180.
- Tanagra cana, 309.
 cyanea, 199.
- Tatler, Wandering, 340.
- Taverner, P. A., see Swales, B. H.
- Teal, Blue-winged, 154, 248, 289, 414, 417, 421.
 Cinnamon, 154-157, 158, 417, 421, 435.
 European, 94.
 Green-winged, 248, 417, 421.
 Red-breasted, 154-157.
- Telmatodytes palustris, 4, 11, 85.
- Terenotriccus fulvularis, 302.
- Tern, Arctic, 454.
 Black, 211, 247, 315, 420.
 Cabot's, 315.
 Caspian, 137, 224, 233, 315.
 Common, 40, 413, 414, 420.
 Forster's, 137, 315, 414, 420.
 Gull-billed, 137, 315.
 Least, 137, 315.
 Noddy, 315.
 Royal, 315.
 Sooty, 315.
- Tetrao, 199.
 Tetrao cupido, 198.
 tetrrix, 199.
 umbellus, 198.
- Thalassœcus antarctica.
- Thallosaëtus pelagicus, 280.
- Thalurania colombica venusta, 296.
- Thamnophilus bridgesi, 296.
 doliatus, 296.
 transandeanus, 296.
- Thayer, Abbott H., protective coloration, 460.
- Thayer, John E., the Whistling Swan at Martha's Vineyard, Mass., 212; the Barn Owl in Massachusetts, 214; the Northern Water-Thrush again nesting in Massachusetts, 446.
- Thayer, John E., and Outram Bangs, notice of their 'Breeding Birds of the Sierra de Antonez, North Central Sonora,' 114; another hybrid Hummingbird — *Selasphorus rufus* + *Atthis caliope*, 312, 313.
- Thrasher, Brown, 24, 85, 175, 178, 180.
 Sage, 344.
- Threnetes ruckeri, 295.
- Thrush, Alma's, 413.
 Bicknell's, 88.
 Dwarf Hermit, 344.
 Gray-cheeked, 25, 86, 176.
 Hermit, 25, 86, 109, 110, 178, 188, 226.
 Olive-backed, 25, 86, 176, 178, 181.
 Song, 116.
 Willow, 88, 412.
 Wilson's, 25, 52, 86, 176, 181, 189.
 Wood, 25, 47, 86, 175, 180, 189, 435.
- Thryomanes bewickii, 25, 149-153, 285.
- Thryophilus modestus modestus, 305.

- Thryophilus pleurostictus albus*, 305.
 rufalbus castanonotus, 305.
 semibadius, 305.
- Thryothorus ludovicianus*, 25, 105, 147, 285, 435.
- Tinamus castaneiceps*, 290.
- Tisa*, 453.
- Titmouse*, Tufted, 25, 170, 172, 173, 174, 178, 285, 431, 435.
- Tityra albitorques fraserii*, 303.
 semifasciatus costaricensis, 300.
- Todirostrum cinereum finitimum*, 300.
 schistaceiceps, 300.
- Tomineio Mariana Virescens* Gut-
 ture flammeo, 448.
- Totanus flavipes*, 95, 254, 426.
 melanoleucus, 95, 254, 426.
- Towhee*, 21, 81, 173, 174, 285, 433.
 Arctic, 412.
 Green-tailed, 344.
 Spurred, 344.
- Townsend, Charles W., notice of his
 'Along the Labrador Coast,' 452.
- Townsend, Charles W., and Glover
 M. Allen, notice of their 'Birds
 of Labrador,' 451.
- Toxostoma rufum*, 24, 85.
- Trichas brachidactyla*, 33.
- Tringa fulicaria*, 196.
 lobata, 196.
- Tringoides*, 198.
 macularius, 291.
- Trochilus alexandri*, 313.
 colubris, 18, 50, 390, 433, 448.
 violajugulum, 313.
- Troglodytes*, 194.
- Troglodytes ædon*, 25, 52, 85.
 intermedius, 304.
 musculus inquietus, 288, 304.
- Trogon*, 192.
 atricollis tenellus, 294.
 bairdi, 294.
 caligatus caligatus, 294.
- Trogon massena*, 294.
 melanocephalus, 294.
- Tryngites subruficollis*, 437.
- Turdus felivox*, 193.
 fuscescens, 52, 56.
 jamaicensis, 194.
 lerebouleti, 194.
 minor, 56.
 trichas, 33.
- Turkey, Wild, 58, 87, 174, 180, 283.
- Turnstone, Ruddy, 141.
- Tympanuchus*, 198.
 americanus, 87.
- Tyranniscus parvus*, 301.
- Tyrannula mexicana*, 219.
 minima, 61.
 pusilla, 62.
 richardsonii, 62.
 saya, 196.
- Tyrannus melancholicus satrapa*,
 302.
 tyrannus, 18, 50, 390, 433.
 tyrannus tyrannus, 302.
 verticalis, 391.
- URIA lomvia, 364.
- Urubitinga, 195.
- VENILORNIS neglectus, 293.
- Vermivora, 193.
- Violon, 320.
- Vireo flavifrons*, 22, 328.
 gilvus, 83, 328.
 gilvus swainsoni, 344.
 novaboracensis, 22, 159, 434.
 olivaceus, 22, 83, 328, 434.
 philadelphicus, 22, 83, 104, 328.
 solitarius, 51, 83, 159, 329.
- Vireo*, Blue-headed, 51, 83, 108, 110,
 159, 178, 181, 329.
 Philadelphia, 22, 83, 104, 328.
 Red-eyed, 22, 83, 108, 110, 170,
 171, 174, 175, 180, 328, 434.
 Solitary, 238.
 Swainson's, 344.

- Vireo, Warbling, 83, 174, 180, 328.
 White-eyed, 22, 159, 170, 172, 173, 174, 175, 180, 434.
 Yellow-throated, 22, 83, 174, 177, 181, 328.
- Vireosylva flavoviridis flavoviridis, 305.
 philadelphia, 305.
- Volatinia jacarini splendens, 311.
- Vultur papa, 198.
- Vulture, Black, 17, 174.
 Turkey, 17, 72, 174, 259, 283, 428, 432.
- WAGTAIL, Kamchatkan, 280.
- Warbler, Audubon's, 413.
 Bachman's, 41-48, 159, 348, 378.
 Bay-breasted, 23, 84, 176, 178, 330, 331.
 Black-and-White, 22, 51, 83, 176, 177, 178, 329, 331, 434.
 Blackburnian, 23, 52, 84, 176, 178, 181, 330, 331.
 Black-poll, 23, 84, 146, 325, 330, 331, 380.
 Black-throated Blue, 23, 52, 83, 108, 110, 322, 325, 330, 331.
 Black-throated Green, 23, 25, 84, 108, 176, 177, 178, 181, 330, 331.
 Blue-winged, 22, 176, 224, 325, 328.
 Brewster's, 343, 348, 444.
 Canadian, 24, 51, 84, 330, 331.
 Cape May, 22, 52, 83, 330, 331, 380, 446.
 Cerulean, 84, 176, 181, 225, 329, 331, 434.
 Chestnut-sided, 23, 84, 176, 177, 178, 181, 329, 331.
 Connecticut, 85, 105, 222, 225, 330, 331.
 Golden-winged, 88, 176, 224, 329, 331.
- Warbler, Hooded, 24, 47, 88, 170, 172, 174, 175, 176, 178, 180, 434.
 Kentucky, 24, 170, 172, 175, 180, 328, 344-346, 434.
 Kirtland's, 84.
 Lawrence's, 342, 343.
 Macgillivray's, 344, 413.
 Magnolia, 23, 52, 84, 176, 178, 330, 331.
 Mourning, 84, 322, 328.
 Myrtle, 23, 83, 108, 178, 285, 322, 330, 331.
 Nashville, 51, 83, 320, 329, 331.
 Northern Parula, 83.
 Orange-crowned, 83, 178, 181, 328, 413.
 Palm, 23, 84, 108, 178, 181, 225, 330, 331.
 Parula, 47, 51, 170, 171, 172, 174, 175, 176, 178, 180.
 Pine, 23, 52, 84, 179, 225, 348.
 Prairie, 14, 24, 84, 181, 188.
 Prothonotary, 47, 88, 170, 171, 172, 174, 175, 178, 180, 342, 434.
 Rocky Mountain Orange-crowned, 379.
 Swainson's, 45, 47, 172, 174, 180.
 Sycamore, 170, 171, 172, 174, 175.
 Tennessee, 83, 176, 177, 178, 322, 329, 331, 348.
 Virginia's, 344.
 Western Parula, 22, 329, 331, 434.
 Wilson's, 84, 328.
 Worm-eating, 22, 177.
 Yellow, 23, 52, 83, 174, 176, 178, 326, 329, 331, 412, 434.
- Warbler, The, notice of, 239.
- Ward, Henry L., notice of his 'Notes on the Herring Gull and Caspian Tern,' 233.

- Water-Thrush, 52, 84, 175, 178, 225, 330, 331.
Louisiana, 84, 328, 434.
Northern, 446.
- Waxwing, Bohemian, 82, 107, 128, 223, 245.
Cedar, 22, 51, 82, 246, 285.
- Wayne, Arthur T., the nest and eggs of Bachman's Warbler, *Helminthophila bachmani* (Aud.), taken near Charleston, South Carolina, 43-48; another Limpkin (*Aramus giganteus*) in South Carolina, 95; the Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*) in Georgia, 100; an early date for the arrival of the Ipswich Sparrow (*Passerculus princeps*) on the coast of South Carolina, 101; Macgillivray's Seaside Sparrow (*Ammodramus martinus macgillivrayii*) with fourteen rec- trices, 102; the Philadelphia Vireo (*Vireo philadelphicus*) in Georgia, 104; observations on some birds procured near Char- leston South Carolina, 377-381; a correction, 446.
- Weber, J. A., the Buff-breasted Sandpiper (*Tryngites subruficollis*) on Long Island, 437; the Vesper Sparrow (*Poæcetes gramineus*) on Long Island, N. Y., in winter, 442.
- Whip-poor-will, 14, 18, 76.
- Willet, 413.
Western, 254, 415-426.
- Williams, R. W., Jr., additional notes on the birds of Leon Coun- ty, Florida, 158, 159; *Loxia curvirostra minor* in Florida, 220; notice of his 'Game Com- missions and Wardens,' 457.
- Wilsonia canadensis, 24, 85, 330, 361.
mitrata, 24, 88, 434.
pusilla, 85, 328.
- Wood, J. Claire, Short-eared Owl and Savanna Sparrow breeding in Wayne County, Michigan, 97; the Pigeon Hawk in Wayne Co., Michigan, 214; autumn records of Golden Plover and Lapland Longspur in Wayne Co., Michi- gan, 223; autumn Warbler migra- tion, 322-331; the White-rumped Sandpiper in Michigan, 339.
- Wood, Nelson R., a White-throated Sparrow in Washington, D. C., in August, 442.
- Wood, Norman A., notice of his 'Twenty-five Years of Bird Migra- tion at Ann Arbor, Michigan,' 231; the breeding of the Short- eared Owl (*Asio accipitrinus*) near Ann Arbor, Michigan, 439.
- Woodcock, American, 339.
- Woodpecker, American Three-toed, 50, 68.
Arctic Three-toed, 50, 76.
Batchelder's, 243, 270.
Downy, 18, 50, 75, 174, 284.
Hairy, 50, 75, 170, 243, 270, 284, 432.
Northern Downy, 432.
Northern Pileated, 76, 432.
Pileated, 18, 50, 170, 174, 270.
Red-bellied, 18, 76, 170, 174, 270, 433.
Red-cockaded, 14, 18, 179, 349.
Red-headed, 18, 76, 174, 270, 433.
Southern Hairy, 17, 170, 174.
Yellow-bellied, 76.
- Woodruff, E. Semour, some inter- esting records from southern Missouri, 348.
- Woodruff, Frank M., rare northern birds near Chicago, Ill., 107; malformed bill of Rose-breasted Grosbeak, 220; notice of his 'The Birds of the Chicago Area,' 363.

- Wren, Bewick's, 25, 149-153, 178, 285.
 Carolina, 25, 105, 147, 170, 172, 173, 174, 285, 435, 446.
 House, 25, 52, 85, 178.
 Long-billed Marsh, 4, 11, 52, 85, 172, 174, 178, 180.
 Rock, 244.
 Short-billed Marsh, 85, 178.
 Texan Bewick, 153.
 Western House, 411.
 Winter, 85, 109, 110, 178.
 Wright, Horace W., the Carolina Wren in Middlesex Fells, Mass., 105; a Kentucky Warbler near Boston, Mass., 344.
- XANTHOCEPHALUS xanthocephalus, 78, 100, 397.
- Xanthomyias, 360.
 Xema sabinii, 247.
- YELLOW-LEGS, 254, 426.
 Greater, 254, 426.
 Yellowthroat, Florida, 172, 174, 180.
 Maryland, 32, 448.
 Northern, 24, 33, 85, 329, 331, 412, 431, 434.
 Southern, 33.
- ZAMELODIA ludoviciana, 21, 81, 220, 442.
 Zenaidura macroura, 17, 72, 259, 283, 428, 432.
 Zonotrichia albicollis, 20, 51, 80, 102, 128, 285, 442.
 leucophrys, 51, 80.

ERRATA.

- Page 17, line 31, for **Haliaëtus** read **Haliaëtus**.
 " 111, " 14, for *leucurus* read *leucura*.
 " 133, " 24, for one grain of read one eighth ounce of.
 " 269, " 25, for **Claucidium** read **Glaucidium**.
 " 328, " 22, for *pusilia* read *pusilla*.
 " 338, " 34, for *cærulea* read *cærulea*.
 " 365, " 15, for June 8, 1907, read June 7, 1907.
 " 433, " 31, for **Coturniculus sandwichensis passerinus** read **Coturniculus savannarum passerinus**.
- On map of Dawson Co., Montana (facing p. 244) for Scale, 12 miles = 1 inch read Scale, 18 miles = 1 inch.
- On map of Custer Co., Montana (facing p. 244) for Scale, 12 miles = 1 inch read 19.4 miles = 1 inch.

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(Continued on 3rd page of Cover.)



